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ABSTRACT

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Teachers' Responses to High-Stakes Testing and the Validity of Gains: A Pilot Study

CSE Report 610

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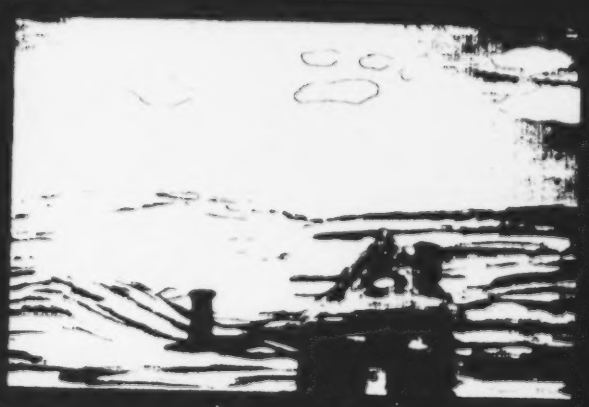

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Project 1.1 Comparative Analyses of Current Assessment and Accountability Systems
Strand 3: The Validation of Gains
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TEACHERS' RESPONSES TO HIGH-STAKES TESTING AND THE VALIDITY OF GAINS: A PILOT STUDY

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Abstract

Previous studies of the validity of gains on high-stakes tests have compared trends in scores on a high-stakes test to trends on a lower-stakes test, such as NAEP. However, generalizability of gains is likely to be incomplete even when gains are meaningful because of differences in the inferences the two tests are designed to support. Therefore, this simple approach is useful only when the disparity in trends on the two tests is very large. A more sensitive but difficult approach requires identifying the specific aspects of performance that increase by varying amounts and comparing these to the specific inferences users base on the score increases. A key to this approach may be identifying the aspects of performance that teachers focus on in their attempts to raise scores. This report presents the results of a pilot study evaluating several types of survey questions designed to elicit from teachers detailed information on their instructional responses to testing. The types of responses explored are those that previous CRESST work (Koretz, McCaffrey, & Hamilton, 2001) suggested are important for validating score gains. Of the formats used, the most promising appears to be questions, the prompts for which are actual test items, including both items from the high-stakes test for which the teachers are preparing and other tests.

Background

Advocates of test-based accountability argue that it improves student achievement by helping teachers focus on important content, providing incentives for good teaching, and producing information that can be used to make decisions about students, teachers, and schools. For such systems to work as intended, the policies must promote good instruction, and any resulting increases in test scores must support valid inferences about increased student achievement. Existing

evidence about the effects of high-stakes testing is both incomplete and inconsistent, but it indicates that there are reasons to question both of these assumptions. Research has shown that high-stakes testing does indeed influence instruction, but these effects are complex and comprise both desirable and undesirable changes in practice. For example, teachers in districts or states where high stakes are associated with test results tend to focus on tested material and de-emphasize untested material (see Stecher, 2002, for a recent review). Similarly, research indicates that the gains in scores on high-stakes tests often generalize poorly (or not at all) to other tests of the same domain, raising doubts about the extent to which these gains provide valid evidence of improved student performance (Klein, Hamilton, McCaffrey, & Stecher, 2000; Koretz & Barron, 1998; Koretz, Linn, Dunbar, & Shepard, 1991; Linn, 2000).

Validity is a property of *inferences* made on the basis of test scores, rather than of the tests themselves (Messick, 1989), and therefore the validity of these gains depends on the specific inferences users based on them. For example, if parents believe that improved math scores at their local high school represent broad improvements in mathematical proficiency, then a failure of generalization of gains to other tests that support similar inferences—say, the SAT, ACT, or the National Assessment of Educational Progress (NAEP)—undermines inferences about improved achievement. In contrast, if their inferences are focused on the district or state content standards and users are not interested in aspects of mathematics not captured in those standards, information about the generalizability of gains to other tests may be less relevant.

Research to date has been unable to distinguish with any precision meaningful gains in scores from score inflation. In some cases, the failure of generalizability is so great as to leave little doubt that gains have been inflated (e.g., Klein et al., 2000; Koretz & Barron, 1998; Koretz et al., 1991), but even then, it has not always been feasible to differentiate clearly between the portion of gains that is meaningful and the portion that is not. For example, Koretz and Barron found that gains in mathematics on Kentucky's KIRIS test were roughly four times as large as the gains Kentucky students showed on NAEP, even though the KIRIS framework was explicitly modeled after the NAEP framework. In the view of the authors, this clearly indicated that gains on KIRIS were substantially inflated, but it did not necessarily indicate that three fourths of the score gains could be construed as inflation.

This report describes a pilot study testing the use of new types of survey questions to elicit from teachers detailed information about responses to testing needed to better evaluate gains in scores. It is one of a series of efforts by CRESST to help develop new approaches better able to distinguish score inflation from meaningful gains in scores.

The Link Between Teachers' Behaviors and the Validity of Gains

The validity of score gains on high-stakes tests is inextricably intertwined with the instructional responses of teachers to the testing program. To the extent that teachers respond with approaches that bolster students' mastery of the domains about which users draw inferences, increases in scores will warrant inferences about improved student achievement. On the other hand, a wide variety of teacher behaviors have the potential to increase scores without similarly increasing the achievement that the scores are intended to represent. Koretz et al. (2001) suggest that in terms of their effects on the validity of gains, teachers' responses to testing can be grouped into seven categories of test preparation:

1) teaching more
2) working harder
3) working more effectively
4) reallocation
5) alignment
6) coaching
7) cheating

The first three of these responses are likely to produce unambiguously meaningful gains in scores. For example, if teachers do not exceed the limit of students to profit from additional work, teaching more and working harder will improve achievement, and working more effectively by definition will increase achievement. At the other extreme, cheating can never produce meaningful gains in achievement. Our concern therefore is with the three remaining types of behavioral response: reallocation, alignment, and coaching.

Reallocation refers to shifts in instructional resources – e.g., teachers' time or students' study time – among various elements of student performance, in order to focus these resources more closely on the specific content of the test used for high stakes. Koretz et al. (2001) note that each relevant element of performance is given

some degree of emphasis (which could be no emphasis at all) by the characteristics of the test. The aspects of the test that can contribute to this emphasis are diverse. They include not only the intended content, but also unintended content or cognitive demands and the style of items or tasks into which the content is embedded. For example, they note a secondary mathematics test that gave considerable emphasis to coordinate geometry. They surmised that this emphasis was inadvertent, for the standards the test was designed to measure did not mention coordinate geometry. This emphasis may have arisen because coordinate geometry provides a useful way to assess many aspects of elementary algebra, which was emphasized by the standards. Koretz et al. argue that to evaluate the validity of gains, it is necessary to formalize this notion of emphasis. They suggest labeling the emphasis accorded to a given element of performance its "effective test weight." They use the term "effective" because the emphasis may not be by design, and they define this weight as the influence of changes in performance on that element on total scores. (Specifically, it is the partial derivative of scores with respect to changes in performance on that element.) Reallocation occurs when teachers or others believe they have discerned the effective weights in the high-stakes test and shift their instructional resources to match these weights more closely. Reallocation is commonly found in studies of teachers' responses to high stakes testing (e.g., Koretz & Barron, 1998; Koretz, Barron, Mitchell, & Stecher, 1996; Koretz, Mitchell, Barron, & Keith, 1996; Stecher, 2002).

The mix of meaningful and inflated gains produced by reallocation depends on several factors: the material receiving greater emphasis, the material receiving reduced emphasis, and the importance of both to the specific inferences drawn by users of the test scores (Koretz et al., 2001). The inferences drawn by users also reflect a set of weights, albeit usually tacit and poorly formed. For example, a user of scores from a ninth-grade mathematics test may place a large weight on basic algebra, in effect assuming that a substantial part of an increase in scores reflects improved mastery of algebra. To the extent that teachers reallocate resources to elements that receive high weights in users' inferences, the validity of gains is enhanced; to the extent that they reduce resources to elements to which users give substantial weights, the validity of gains is undermined.

Alignment between standards (or curricula) and tests is often presented as an unmitigated good, but from the perspective of the validity of score gains, it is nothing more than a specialized case of reallocation in which the material receiving

additional emphasis is consistent with standards (i.e., in which the material given additional emphasis in instruction was considered important by those setting the standards and was therefore emphasized in them). For several reasons, however, alignment is not sufficient to ensure validity of gains. First, it is not always certain that the standards as written convey accurately and completely the content and skills intended by those establishing the standards. Second, the validity of gains hinges not primarily on the inferences intended by those setting the standards and designing the test, but more importantly on the actual inferences drawn by users of the scores. Users' inferences may differ substantially from those of the standard setters. Third, and most important, validity depends on importance of both the material receiving more emphasis *and the material receiving less emphasis* to the inferences users base on test scores. Hence, alignment, while increasing the probability that students will learn material deemed by the standards-setters to be important, offers no guarantee against score inflation.

Coaching is the most difficult of these categories of test preparation to describe, and it shades into both reallocation at one extreme and cheating at the other. Coaching refers to a focusing of instructional resources on narrow, specific aspects of the particular test. These may be either substantive or non-substantive, and the aspects receiving greater emphasis may or may not be those intentionally emphasized by the developers of the test. For example, a teacher may recognize that items in a given test always present regular polygons and therefore may focus instruction only on those, at the expense of irregular polygons. Alternatively, the teacher may recognize that items of a given type are usually presented or scored in a particular way and may focus on these details rather than on the content more broadly. To the extent that the inferences drawn by users are not limited to these specific aspects of the test, resulting score gains will be misleadingly large.

Extant research on the instructional effects of high-stakes testing does not examine teachers' responses at the level of detail needed to differentiate among these seven categories and is therefore insufficient for purposes of the validation of score gains. For example, we know that teachers often reallocate instructional time, both within and between subjects, in response to testing (e.g., Koretz, Barron, et al., 1996; Koretz, Mitchell, et al., 1996; Stecher, 2002). Similarly, research has shown that many teachers rely on a variety of test-preparation activities that are consistent with the definition of coaching used here (e.g., Koretz, Mitchell, et al.; Koretz, Barron, et al.). However, this research offers only a coarse view of the specific elements of

instruction that garner increased and decreased attention and the specific test-preparation techniques applied. As a result, the findings obtained from this research lack the level of detail required to map teacher's responses adequately to the inferences that users base on increases in scores.

Research Questions

In response to the limitations of extant efforts to evaluate the validity of score gains obtained under high-stakes conditions, CRESST has undertaken a multi-year effort to develop more productive approaches to this question. The first stage in this effort was the development of a conceptual framework for the validation of gains (Koretz et al., 2001). This paper represents a second stage of this ongoing effort: a pilot study to explore the feasibility of using surveys of teachers to obtain more detailed information about their responses to high-stakes testing that could be applied to the validation of gains.

The primary goal of this study is to ascertain whether various types of survey questions can begin to capture the types of behavioral responses to testing implied by the framework above. Among our principal questions were these:

- Can teachers understand and respond to survey questions that ask directly about the types of behavioral responses implied by the framework above?
- Can teachers distinguish test items that appeared on their state tests from test items that did not appear on their state tests, and if so, can survey questions based on test items be used to clarify teachers' behavioral responses to testing?
- Can teachers distinguish content areas emphasized in items on their state tests from areas less emphasized, and can survey questions based on these content areas be used to clarify teachers' behavioral responses to testing?

The primary purpose of this study is to provide information that can guide future research on the effects of high-stakes testing. It is not primarily intended to provide information about the prevalence of particular practices, and the sample is not designed to support generalization to populations of interest. The report does include information on the distribution of responses to high-stakes testing, but this information is intended primarily to provide context (e.g., to establish whether the convenience sample used is in some respects similar to those of other studies) and to help evaluate the more novel survey items used. The findings should not be construed to support strong conclusions about the behaviors of teachers in our

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study, to support conclusions about the effects of any state testing program, or to make inferences about the effects of high-stakes testing more generally.

Methods

In this section we describe our research methods: the sample of teachers, the data collection instruments, and the analytic approach.

Study Participants

This study examined secondary mathematics teachers' responses to the Massachusetts Comprehensive Assessment System (MCAS) tests. MCAS is an accountability-oriented system of tests first administered in 1998. The MCAS assessments are used to produce scores for both students and schools. The study design focused on mathematics in Grades 8 and 10 because of the nature of the MCAS assessment and accountability system. Although scores at all grades are used in school accountability, only the 10th-grade scores have high stakes for individual students. Thus, 10th-grade teachers might feel more pressure to raise scores and therefore might more frequently respond with behaviors that might inflate scores. While the sample size would not support a formal comparison of the two grades, differences between them could be suggestive.

The survey focused primarily on the Boston public schools for convenience (location) and two reasons of design: It contains a large number of low-scoring students, so pressure to raise scores would be high; and it is large enough to provide a reasonable sample. Newton, a very high-achieving, affluent, and well-educated neighboring suburb, was selected as a second site because it provides a striking contrast to Boston, and its very different characteristics might lead to different responses by teachers to the MCAS assessment.

Teachers in Boston were recruited by research assistants at one of four half-day mathematics inservice workshops that the district provided in late February and early March to support the teachers as they adopted a new curriculum. At these workshops, 91 teachers volunteered. Teachers in Newton were recruited by the math coordinator of the district. Three teachers initially volunteered. Teachers were asked to complete a survey and participate in a telephone interview that would last approximately 30 minutes. In exchange, teachers received an honorarium of $100.

Ten of our initial pool of 94 participants were disqualified because they taught only one mathematics class per day. These teachers were excluded because we assumed that mathematics was not their central concern, and we expected them to be less attentive to preparing students for the mathematics test. Of the remaining 84 teachers, 51 (61%) completed all data collection described below. Twenty-one (41%) of the teachers who completed the data collection taught 8th-grade mathematics, and the remaining 30 (59%) taught 10th-grade mathematics. The remaining 33 teachers who did not complete the study decided not to participate, could not be contacted, or completed the survey with sufficient errors that the data could not be used. Only 3 of the final sample of 51 teachers taught in Newton, so no comparison could be drawn between the districts.

Instruments

This study focuses primarily on paper-and-pencil questionnaires. In addition, we conducted telephone interviews with all teachers after they completed their surveys. Only a few results from the interview data are described here.

The questionnaire included four sections. The first section gathered background information, including the number and titles of courses taught. Teachers were asked to consider the first 8th- (or 10th-) grade mathematics class of the day the "target" class and were instructed to respond to the remaining questionnaire items based on this class. The first section also asked teachers to rate the math achievement levels of their schools in relation to the state and of students in the target class in relation to the school. In the second section, we asked several types of questions about teachers' responses to the MCAS test. These questions had several purposes. A few were designed to put the teachers' responses into context – for example, questions about the degree of pressure respondents felt to raise scores and the amount of flexibility they had to respond. A few were similar to those used in earlier surveys and could help to clarify whether the small convenience sample used in this pilot led to anomalous responses.

This section included one multi-part question about the resources teachers used for test preparation (e.g., old test items and the Massachusetts Department of Education's test preparation website). It also included a long, multi-part question that asked how respondents' teaching is different from what it would be without MCAS. The prompts were intended to categorize common test-preparation activities consistently with the framework described above. For example, one part asked how

much respondents shifted emphasis among strands or topics in the mathematics curriculum; another asked how much they tailored instruction to "particular styles and formats of problems in MCAS."

One of the questions motivating this study was what types of survey questions would be useful for eliciting information about the types of test preparation relevant to validation. It was not clear that questions of the sort just described–that is, questions relying on verbal descriptions of categories of response – would be clear enough to respondents to elicit useful information. We therefore included a section of novel questions based on actual test items from MCAS and NAEP. The rationale for including items from NAEP is discussed below. Six MCAS and four NAEP items were included. Teachers were given no information about the source of the items, and the textual parts of the items were reformatted so that format would not provide a hint about the source. Teachers were asked an identical set of questions about each item. These included whether they recognized each item and, if so, from where; what skills or knowledge they thought the item required; and whether they taught the content of the item. Additional follow-up questions were asked, depending upon teachers' responses to the question about whether they taught the item. The final section of the questionnaire presented seven specific content areas (e.g., "use proportional thinking to solve problems") and asked teachers a series of questions about each, including whether or not they taught that content area. A copy of one of the survey forms is included as the Appendix.

As discussed earlier, a common consequence of high-stakes testing is a tendency for teachers to shift time and effort toward tested content and away from material that is not included in the test. One of the objectives of this effort was to examine methods for exploring this phenomenon. With only one year of data collection, we were not able to observe changes in emphasis directly. To explore changes in emphasis, we followed two strategies. First, we asked a variety of questions about how MCAS influenced teachers' practice (e.g., how their practice would change if MCAS were not given). Second, we asked a series of questions based on individual test items or descriptions of content categories that had varying degrees of emphasis in MCAS. These were designed to focus teachers' responses about their practice on specific content and styles of items.

To create the latter group of questions, it was necessary to identify item types and content areas that had varying emphasis on the MCAS. As one step in this process, we compared the NAEP Mathematics Framework to both released NAEP

items and three years of released MCAS test forms. We categorized each item on each test form in terms of the elements of the framework. The authors categorized items independently and then reconciled differences. This process yielded a tally indicating how frequently each element of the NAEP framework was the focus of NAEP and MCAS items. As a guide to selecting items and content areas for inclusion in the report, we noted the framework elements that appeared frequently in one of the tests and rarely or never in the other.

As a second step, both authors examined both item sets independently to find patterns in the styles of items presented. Starting with the eighth-grade MCAS, we identified 13 types of items that were repeated across years (e.g., problems involving numerical and geometric series, problems that required mentally cutting open a three-dimensional shape, and problems entailing very simple rotations of figures), as well as two items that were not repeated but seemed to both authors to be quite unusual. We examined NAEP released items both to see if item types we had identified in examining MCAS appeared in NAEP and to find types of items that appeared in NAEP but not in MCAS. For example, we noted that NAEP included items with irregular polygons, while the MCAS forms we used presented only regular polygons. Conversely, two of three MCAS forms presented algebra items in a pictorial format not used in NAEP.

Based on these two steps, we selected 6 items from MCAS and 4 from NAEP to include in the survey in each grade. In addition, for the 8th-grade survey we selected 5 content areas to represent MCAS and 2 to represent NAEP. For the 10th-grade survey, we selected 4 MCAS and 3 NAEP content areas.

Although the resulting sets of items and content areas are in some sense characteristic of the two assessments, by design they are not representative of them. Our goal was to determine whether surveys can be used to identify ways in which teachers focus their test-preparation efforts on details that recur in the tests for which they are held accountable. Therefore, we attempted to identify content areas and types of items that received particular emphasis in the high-stakes test, as well as commonly taught aspects of content and problem types that are given little or no emphasis on that test, in order to determine whether we could discern shifts in teachers' emphasis corresponding to these. For this purpose, types of items common to both assessments are not useful, even though such items must be included to fully represent the test and therefore must be included in other types of work evaluating the validity of gains.

Findings

In this section we first present basic summary information on the background and general test preparation questions from the survey, followed by a discussion of responses to the specific item and content questions. Because the type and magnitude of test-related pressure is likely to differ for 8th- and 10th-grade teachers, we present most results separately by grade.

Background Questions

The results presented in this section provide information on the teachers in the sample and the contexts in which they were teaching. Among the 30 10th-grade teachers, all of whom taught in the Boston Public Schools, the average amount of teaching experience was 12 years, with experience ranging from 1 to 31 years. Three participants taught special education classes primarily.

The 8th-grade sample included 21 teachers, 3 from Newton and the remaining 18 from Boston. As with the 10th-grade sample, the average experience level was 12 years, and experience ranged from 1 to 35 years. Only 1 teacher in this group reported teaching special education.

As shown in Table 1, a majority of teachers at each grade reported that their school was performing at or below the state average. This is somewhat consistent with the generally low performance of Boston schools, though based on the state's published test scores, nearly all teachers should have reported below-average school performance. All three Newton teachers reported achievement levels that were

Table 1

Percentages of Teachers Reporting Above-Average, Average, or Below-Average Achievement of the School as Compared With Other Schools in the State (*N* in Parentheses)

	Grade 8	Grade 10
Substantially below average	29 (6)	40 (12)
Moderately below average	29 (6)	30 (9)
About average	19 (4)	17 (5)
Moderately above average	5 (1)	7 (2)
Substantially above average	19 (4)	7 (2)

substantially above average, which is consistent with published results for that district.

The fact that teachers' perceptions of their school's achievement were not always consistent with published test scores suggests that teachers are either unaware of how their school ranks or that they are using criteria other than test scores to evaluate achievement. Either way, these results indicate the importance of verifying teacher-reported information about achievement if the purpose of the data collection is to understand how well students are actually performing.

Teachers were also asked to compare the math achievement level of the class about which they were responding with that of other classes in the school. A majority of 8th-grade teachers reported average achievement levels, whereas only a third of 10th-grade teachers did so (see Table 2). This difference was expected, given the higher proportion of tracked classes in the 10th grade. Unfortunately, we have no information with which to verify the accuracy of these reports. If this information were important for subsequent analysis, it would be worth gathering additional data to corroborate teachers' responses to this question.

Questions About General Responses to MCAS

The first of the questions addressing general responses to MCAS asked teachers how much pressure they felt to improve their students' performance on the MCAS Mathematics test. Because the nature and amount of pressure is likely to vary across districts, we omitted the three 8th-grade Newton teachers from this table. Slightly more than half of the teachers at each grade reported feeling "a great deal"

Table 2

Percentages of Teachers Reporting Above-Average, Average, or Below-Average Achievement of the Class as Compared With Other Classes in the School (*N* in Parentheses)

	Grade 8	Grade 10
Substantially below average	5 (1)	10 (3)
Moderately below average	16 (3)	27 (8)
About average	68 (13)	33 (10)
Moderately above average	11 (2)	20 (6)
Substantially above average	0	10 (3)

of pressure to improve their students' scores (Table 3). Only two teachers in 10th grade reported feeling no pressure, and none of the Boston 8th-grade teachers gave this response. These results suggest that even though the formal stakes were higher at 10th grade at the time of the survey, teachers at 8th grade were as likely to experience significant pressure for score improvement. While these findings suggest that our sample of teachers felt considerable pressure as a result of MCAS, comparison with other studies suggests that these findings represent a relatively modest degree of pressure, and that in turn may help explain some of the relatively modest patterns shown in our subsequent survey results. For example, Koretz, Barron, et al. (1996) asked Kentucky teachers whether they agreed with the statement that teachers were under "undue pressure to improve students' performance on KIRIS" (the state assessment used for accountability purposes). Almost all (98%) of a state-representative sample of teachers agreed with this statement, and 80% strongly agreed with it.

Because of the differing level of stakes for students at the two grades, we expected 10th-grade teachers to report higher levels of pressure than 8th-grade teachers. It is possible that the question as written was not sufficiently sensitive to differences that might exist. On the other hand, perhaps 8th-grade teachers do experience pressure despite the lack of high stakes. Case studies of Florida schools suggest that simply publishing scores and assigning grades or ratings to schools creates pressure for school staff to maintain or increase their standing (Goldhaber & Hannaway, 2001). To more fully understand these results and the absence of any clear difference between the grades it would be necessary to gather information on the sources of the pressure.

Table 3

Percentages of Teachers Reporting Feeling Pressure to Improve Their Students' Scores on the MCAS Mathematics Test (*N* in Parentheses)

	Grade 8	Grade 10
None	0	7 (2)
A small amount	17 (3)	17 (5)
A moderate amount	26 (5)	23 (7)
A great deal	53 (10)	53 (16)

The second question in this section asked teachers to describe how well MCAS was aligned with the curriculum in place in their schools. Table 4 shows that nearly 60% of the 10th-grade teachers and slightly more than half of the 8th-grade teachers reported that MCAS was "fairly well" aligned with their school's curriculum. Approximately one third of teachers at each grade said MCAS was poorly aligned with their school's curriculum, either because it included material not in the curriculum or because it omitted material that is included in the curriculum.

The next set of questions was designed to gather information on test-preparation activities. The first question in this set asked teachers to describe how much emphasis they placed on various test-preparation resources (Tables 5 and 6). The specific resources listed in this question were chosen based on pilot interviews with teachers and inspection of the Massachusetts Department of Education's website. Among the resources listed, teachers in both grades were most likely to report strong emphasis on old MCAS items and other sample MCAS items (e.g., those available in materials published by the Department of Education). Other resources, such as the Princeton Review's *Cracking the MCAS*, the Boston Public Schools' "Tool Kit," and the Massachusetts Department of Education's MCAS website, were used infrequently, especially by 8th-grade teachers. The Princeton Review book was designed for the 10th-grade test, so it is not surprising that hardly any 8th-grade teachers said they used this. In general 10th-grade teachers reported more emphasis and a greater variety of test-preparation materials than 8th-grade teachers, but teachers in both grades relied most heavily on actual test items. This indicates that the test itself has a strong influence on curriculum and instruction, a finding that is consistent with other work (Stecher, 2002). It suggests substantial reallocation and coaching, but without providing the detail needed to apply the framework suggested by Koretz et al. (2001).

Table 4

Percentages of Teachers Reporting Alignment Between School's Curriculum and MCAS (*N* in Parentheses)

	Grade 8	Grade 10
Poorly, because MCAS includes considerable material that is not in our curriculum	19 (4)	24 (7)
Poorly, because MCAS omits considerable material that is in our curriculum	10 (2)	10 (3)
Fairly well, although the overlap is not complete	52 (11)	59 (17)
Very well	19 (4)	7 (2)

Table 5

Percentages of Teachers Reporting Emphasis on Test-Preparation Resources, Grade 8 (*N* in Parentheses)

	No emphasis	Slight emphasis	Moderate emphasis	Great emphasis
Old MCAS items	0	19 (4)	24 (5)	57 (12)
Other sample MCAS test items	5 (1)	20 (4)	30 (6)	45 (9)
MCAS scoring rubrics	10 (2)	29 (6)	33 (7)	29 (6)
The Princeton Review's *Cracking the MCAS*	95 (18)	5 (1)	0	0
The MCAS2003.com website	72 (13)	17 (3)	11 (2)	0
The BPS "Tool Kit"*	73 (11)	13 (2)	7 (1)	7 (1)
Other commercial test-prep books or materials	42 (8)	32 (6)	26 (5)	0
Other DOE or BPS test-preparation materials*	47 (9)	16 (3)	11 (2)	26 (5)

*For Newton teachers, the BPS Took Kit item was not presented, and the final item mentioned only DOE materials. Percentages for this option are based only on the 18 Boston teachers.

Table 6

Percentages of Teachers Reporting Emphasis on Test-Preparation Resources, Grade 10 (*N* in Parentheses)

	No emphasis	Slight emphasis	Moderate emphasis	Great emphasis
Old MCAS items	3 (1)	10 (3)	33 (10)	53 (16)
Other sample MCAS test items	7 (2)	10 (3)	43 (13)	40 (12)
MCAS scoring rubrics	14 (4)	39 (11)	25 (7)	21 (6)
The Princeton Review's *Cracking the MCAS*	66 (19)	24 (7)	3 (1)	7 (2)
The MCAS2003.com website	43 (13)	47 (14)	10 (3)	0
The BPS "Tool Kit"	47 (14)	30 (9)	20 (6)	3 (1)
Other commercial test-prep books or materials	38 (11)	38 (11)	10 (3)	14 (4)
Other DOE or BPS test-preparation materials	37 (11)	23 (7)	30 (9)	10 (3)

To understand the degree to which teachers had freedom to engage in test preparation activities, we asked them how much flexibility they had to modify their curriculum and instruction in response to MCAS. Table 7 presents these results. We excluded the three Newton teachers from this table because of fundamental differences in the district contexts in which they are operating. Two thirds of teachers at each grade reported having very little flexibility, and no 10th-grade teachers said they had a great deal. Among the three Newton teachers, one reported having a great deal of flexibility, and the other two reported a moderate amount. Teachers who chose "very little, but for some other reason" were asked to specify the reason. A total of six teachers chose this option, and most of those who provided an explanation indicated that the reason was related to curricular requirements (e.g., "my school required all geometry teachers to spend the first three months teaching more algebra 1"). It is not clear why these teachers chose the second rather than the first option, but the responses suggest these two options could be combined without loss of information.

The lack of flexibility reported by the Boston teachers – which many of them reiterated in interviews – is important for evaluating our methods, which were designed with the expectation that teachers had considerable flexibility. We return to this in the final Discussion section.

In the next question, we attempted to capture information about the types of test preparation described in Koretz et al. (2001) and discussed in the introduction to this report. Because not all teachers had taught prior to the introduction of MCAS in 1998, we were unable to ask about specific changes they had made in response to the introduction of a high-stakes test. Instead, we asked teachers about ways in which their teaching might be different because of MCAS than it would be without MCAS. We developed several categories of responses that corresponded to some of the

Table 7

Percentages of Teachers Describing Flexibility to Modify Their Curriculum and Instruction in Response to MCAS (*N* in Parentheses)

	Grade 8	Grade 10
Very little, because my school or district requires me to adopt a specific curriculum	67 (12)	67 (20)
Very little, but for some other reason	6 (1)	10 (3)
A moderate amount	11 (2)	23 (7)
A great deal	17 (3)	0

types of test preparation discussed at the beginning of this paper and in Koretz et al. (2001). As we discuss later in the section on questions about specific test items, we found the task of describing the different forms of test preparation to be challenging. In particular, distinguishing among some of the subtle types of reallocation and coaching was difficult, and we found from our interviews that teachers did not always understand these distinctions from the questions we posed. Thus, although the responses regarding the broad categories of test preparation reported here are likely to be reasonably accurate, responses to some of the specific parts may be less so.

The responses of eighth-grade teachers suggest that MCAS substantially influenced instruction, in both desired and undesired ways (see Table 8). Almost all 8th-grade teachers reported placing a greater emphasis on writing in mathematics. At the other extreme, about two thirds of the teachers reported that they had not assigned more homework or more difficult homework. A majority of teachers reported some reallocation and coaching. Their responses showed some differentiation among types of reallocation and coaching, which is a positive sign about the potential utility of questions of this sort, but the small number of respondents make these results only suggestive. Ranking the items in terms of the percentages of teachers who responded that they used each method either "not at all" or "a great deal" yielded fairly consistent patters. Apart from assigning homework, the types of preparation most often cited as not used at all were shifting time from material *not* in the local curriculum and finding more effective teaching methods. Both would generally be considered desirable responses. Almost half said that they had relied not at all on finding more effective methods of teaching. Apart from placing more emphasis on writing, the approach used a great deal was giving more emphasis to "test-taking strategies, such as 'plugging in' and 'process of elimination,'" which we consider undesirable because it will not provide the students with greater understanding of mathematics. Most teachers reported that they "look for patterns in the ways that MCAS presents a given type of content and emphasize those in [their] instruction"—an aspect of coaching that we were particularly interested in exploring—but a majority of teachers said they relied only "somewhat" on this approach.

Table 8

Percentages of Teachers Reporting That Ways in Which Their Teaching Is Different Because of MCAS, Grade 8 (*N* in Parentheses)

	Type of test preparation	Not at all	Somewhat	A great deal
I spend more time teaching mathematics content (e.g., by replacing non-instructional activities with instruction on mathematics).	Teaching more	37 (7)	42 (8)	21 (4)
I assign more homework or more difficult homework.	Teaching more	60 (12)	35 (7)	5 (1)
MCAS has prompted me to find more effective teaching methods (more effective in general, not specifically targeted to MCAS).	Working more effectively	43 (9)	43 (9)	14 (3)
I focus more on the Massachusetts Curriculum Framework Content Standards in mathematics.	Reallocation	14 (3)	57 (12)	29 (6)
I shift emphasis among topics or strands of the mathematics curriculum to focus more on material emphasized in MCAS (e.g., shifting instructional time from coordinate geometry to plan geometry or vice-versa).	Reallocation	29 (6)	57 (12)	14 (3)
I focus more on the aspects of performance that are stressed by the MCAS scoring rubrics.	Reallocation	16 (3)	58 (11)	27 (5)
I place a greater emphasis on writing with mathematics.	Reallocation	10 (2)	52 (11)	38 (8)
I shift emphasis from other mathematics material *not in the local curriculum* to focus more on material emphasized in MCAS.	Alignment, reallocation	48 (10)	43 (9)	10 (2)
I look for patterns in the ways that MCAS presents a given type of content and emphasize those in my instruction (e.g., using coordinate geometry to present algebra problems).	Coaching	24 (5)	62 (13)	14 (3)
I look for particular styles and formats of problems in MCAS and emphasize those in my instruction (e.g., using unusual pictures or symbols to present algebra problems; using specific key phrases).	Coaching	10 (2)	62 (13)	29 (6)
I place more stress than I would on mathematics test-taking strategies, such as "plugging in" and "process of elimination."	Coaching	5 (1)	57 (12)	38 (8)
I spend more time teaching and encouraging generic test-taking strategies such as time management or eating a good breakfast.	Coaching	33 (7)	57 (12)	10 (2)

The responses of 10th-grade teachers were in many respects similar but differed in a few suggestive ways (see Table 9). Increased emphasis on writing was again the most commonly reported approach. Eighth-grade teachers placed somewhat more emphasis on test-taking strategies than 10th-grade teachers, whereas 10th-grade

Table 9

Percentages of Teachers Reporting That Ways in Which Their Teaching Is Different Because of MCAS, Grade 10 (*N* in Parentheses)

	Type of test preparation	Not at all	Somewhat	A great deal
I spend more time teaching mathematics content (e.g., by replacing non-instructional activities with instruction on mathematics).	Teaching more	38 (11)	31 (9)	31 (9)
I assign more homework or more difficult homework.	Teaching more	53 (16)	27 (8)	20 (6)
MCAS has prompted me to find more effective teaching methods (more effective in general, not specifically targeted to MCAS).	Working more effectively	37 (11)	37 (11)	27 (8)
I focus more on the Massachusetts Curriculum Framework Content Standards in mathematics.	Reallocation	27 (8)	37 (11)	37 (11)
I shift emphasis among topics or strands of the mathematics curriculum to focus more on material emphasized in MCAS (e.g., shifting instructional time from coordinate geometry to plan geometry or vice-versa).	Reallocation	13 (4)	47 (14)	40 (12)
I focus more on the aspects of performance that are stressed by the MCAS scoring rubrics.	Reallocation	28 (8)	52 (15)	21 (6)
I place a greater emphasis on writing with mathematics.	Reallocation	7 (2)	57 (16)	36 (10)
I shift emphasis from other mathematics material *not in the local curriculum* to focus more on material emphasized in MCAS.	Alignment, reallocation	37 (11)	40 (12)	23 (7)
I look for patterns in the ways that MCAS presents a given type of content and emphasize those in my instruction (e.g., using coordinate geometry to present algebra problems).	Coaching	20 (6)	53 (16)	27 (8)
I look for particular styles and formats of problems in MCAS and emphasize those in my instruction (e.g., using unusual pictures or symbols to present algebra problems; using specific key phrases).	Coaching	27 (8)	30 (9)	43 (13)
I place more stress than I would on mathematics test-taking strategies, such as "plugging in" and "process of elimination."	Coaching	23 (7)	40 (12)	37 (11)
I spend more time teaching and encouraging generic test-taking strategies such as time management or eating a good breakfast.	Coaching	40 (12)	43 (13)	17 (5)

teachers reported more reallocation among mathematics topics. Tenth-grade teachers showed less differentiation among types of test preparation, but this could easily be a result of the small sample sizes. In general, there was a slight tendency for 10th-grade teachers to report more changes in their instruction in response to MCAS than 8th-grade teachers, but the difference was not large. This is not surprising given the similar levels of pressure reported by the two groups of teachers.

The next question asked teachers to describe the magnitude of MCAS gains at their schools between 2000 and 2001. Those who responded that their schools' scores had increased were then asked to rate the importance of a set of factors that may have contributed to those gains. This provides important contextual information for interpreting teachers' responses regarding test preparation activities. Table 10 shows that while most teachers reported some gain, only 10th-grade teachers said their schools' scores had risen "a great deal." This difference is consistent with published test scores, which show that 8th-grade scores did not rise much but 10th-grade scores did. However, there appears to be a tendency for teachers to overestimate the magnitude of gain, based on the fact that more than half of the 8th-grade teachers reported some gain.

Table 11 summarizes the responses to the question about attributions of gains. Teachers who responded "not at all" or "I don't know" were instructed to skip this question, so the number of respondents represented in these tables is small. We, therefore, combined results across the two grades, although the responses did differ somewhat between the grades.[1] Responses are sorted by the percentage of teachers who attributed a great deal of impact to each factor.

Table 10

Percentages of Teachers Reporting Increase in MCAS Scores Between Spring 2000 and Spring 2001 (*N* in Parentheses)

	Grade 8	Grade 10
Not at all	10 (2)	10 (3)
A small amount	24 (5)	20 (6)
A moderate amount	38 (8)	17 (5)
A great deal	0	37 (11)
Don't know	29 (6)	17 (5)

[1] 10th-grade teachers were more likely than 8th-grade teachers to attribute gains to test-preparation activities, to increased familiarity with the content of MCAS, and to motivation.

The attribution of gains reported by many teachers suggests the possibility of inflated score gains. Broad improvements in students' knowledge and skills – that is, improvements that are unarguably a source of valid gains – were the least often cited as having a great deal of impact. Improvements in the knowledge and skills emphasized in MCAS, which could result in either meaningful or inflated gains, were roughly in the middle of the list. The factors cited most often as having a great deal of impact were increased familiarity with the MCAS assessment and work with practice tests and other test preparation materials, which could lead to test-specific gains that would not generalize well. Despite differences in the assessment programs, the grades surveyed, and the unrepresentativeness and very small size of the convenience sample in this study, these percentages are remarkably similar to responses obtained in large, state-representative samples of teachers in earlier studies of Kentucky and Maryland (Koretz, Barron, et al., 1996; Koretz, Mitchell, et al., 1996). This may suggest commonalities in teachers' responses to high-stakes testing, and it provides a measure of assurance that responses to this pilot study are not badly distorted by the nature of the sample.

Table 11

Percentages of Teachers Reporting That Various Factors Had a Moderate Amount or Great Deal of Impact on Scores, Both Grades (*N* in Parentheses)

	A moderate amount	A great deal
Increased familiarity with the MCAS assessments	33 (12)	56 (20)
Work with practice tests and other preparation materials	36 (13)	53 (19)
Increased student motivation	31 (11)	39 (14)
Improvements in students' mastery of knowledge and skills that are emphasized in MCAS	36 (13)	36 (13)
Improved test-taking skills	42 (15)	25 (9)
Differences between student cohorts from year to year	19 (7)	14 (5)
Broad improvements in students' knowledge and skills	44 (16)	11 (4)

Note. Respondents include only those teachers who said their school's scores rose between 2000 and 2001.

Item-Based Questions

The attributes of test items upon which teachers can focus to raise scores—what Koretz, et al. (2001) called substantive and non-substantive performance elements—are diverse and difficult to describe clearly. We found it difficult to translate these concepts into common language in writing the survey reported here, and some of our respondents found it difficult to understand the terminology used. Tables 8 and 9 presented the results for question 6, in which teachers were asked to characterize ways in which their teaching is different than it otherwise would be because of MCAS. Among the choices were "I look for patterns in the ways that MCAS presents a given type of content and emphasize those in my instruction" and "I look for particular styles and formats of problems in MCAS and emphasize those in my instruction." These phrases all represented specific attributes of MCAS items identified by the authors, and although we provided examples to clarify the phrases, our interviews suggest that some respondents could not understand the differences between them.

We created questions based on specific test items in an effort to circumvent this difficulty. Our goal was to test questions that illustrate these attributes concretely with test items rather than identifying them with general labels such as "styles of problems." Six of the 10 items administered to survey respondents at each grade level were items from past MCAS assessments that had been chosen by the authors to represent attributes that the authors found characteristic of MCAS. These attributes included item format, styles of presenting material, and specific content. The remaining four items were publicly released NAEP items that did not share these characteristics. Because NAEP is not administered in the 10th grade, we selected for the 10th-grade sample NAEP items administered in both Grade 8 and Grade 12. Each item was followed by a series of questions asking the teacher if he or she recognized the item and if so from what source, what students need to know or be able to do to answer the question, whether the teacher taught this content, and why or why not (see Appendix). Although the specific questions were different, this general approach has some similarities to the item-based methods used to explore opportunity to learn in the First and Second International Mathematics Studies (see Floden, 2002).

Examples of sample items. An example of an MCAS item selected on the basis of content is shown in Figure 1. This item was chosen because it is flagged in the

Princeton Review's *Cracking the MCAS Grade 10 Math* (Princeton Review, 2000), a test-preparation book that could be located via a state-sponsored website but that our survey showed to be emphasized relatively little by respondent teachers (see Tables 5 and 6). Specifically, in a section labeled "Special Triangle Rules," *Cracking the MCAS* stated that "one triangle rule that is often tested on the MCAS exam is the *third side* rule. The rule is: The sum of every two sides of a triangle must be greater than the third side" (Princeton Review, p. 52).

> **Item H.** If the perimeter of an isosceles triangle is 24 cm, which of the following **cannot** be the base?
>
> A. 4 cm
>
> B. 6 cm
>
> C. 10 cm
>
> D. 12 cm

Figure 1. A sample 10th-grade MCAS item.

Most of the items chosen for inclusion in the survey, however, had more obvious attributes that made them (in the opinion of the authors) characteristic of the MCAS. For example, we found that the MCAS tests included algebra problems with unconventional representations of unknowns. One example, in which unknowns are represented as polyhedra and equality is represented by equal levels on a balance beam, is shown in Figure 2. Two such items were found in the three eighth-grade MCAS tests we examined.

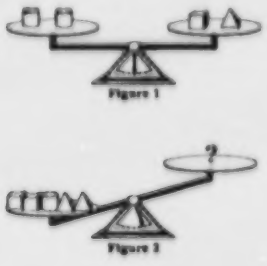
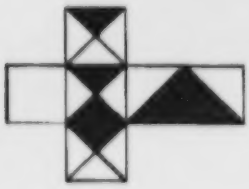
> **Item F.** Use the balance scales below to answer the question below.
>
> 
>

Figure 2. A sample 8th-grade MCAS item.

The MCAS tests we examined also included a number of items that we considered to be tapping spatial visualization skills, a type of item lacking in many other assessments. An example from the 10th-grade survey is shown in Figure 3. The test also included a number of items focusing on numerical or geometric series. In fact, this was one of the most common problem types we identified, and one that many teachers identified as representative of MCAS in our interviews. When asked two open-ended questions—"Have you noticed any aspects of mathematics that get particularly strong emphasis on MCAS? If so, what are they?"; and "Have you noticed any specific content that appears frequently in MCAS items?"—one-fourth of our teachers mentioned patterns or sequences in response to one or both questions. An example of this type of item is shown in Figure 4.

Item C. Use the figure below to answer the next question.



If the above figure is folded into a cube, which of the following solids will be formed?

A.

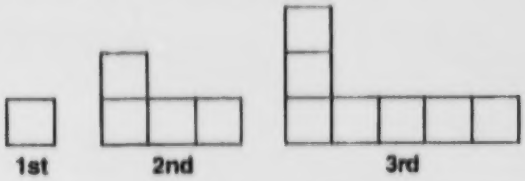
B.

C.

D.

Figure 3. A sample 10th-grade MCAS item.

Item D. Each arrangement in this pattern is made up of tiles.



How many tiles will be in the 6th arrangement in the pattern?

Figure 4. A sample 8th-grade MCAS item.

Several of the MCAS forms we reviewed included a long open-response question about simultaneous equations, typically presented as a comparison between two billing or cost structures. We included one example, shown in Figure 5.

Item F. Use the chart below to answer the question below.

Billing Plans for Cellular Phone

	Basic charge per month	Number of free minutes per month	Charge per minute
Plan 1	$16	0	$0.35
Plan 2	$30	50	$0.15 after free minutes are used

Mr. Chrostowski is choosing one of the billing plans shown above for his cellular phone. He estimates that he will use the phone less than 50 minutes per month.

A. If he chooses Plan 1 and uses the phone exactly 50 minutes in one month, what will his bill be for that month?

B. Suppose that he chooses Plan 1 and uses the phone *m* minutes in one month. Write an equation for his total bill, *B*, for that month.

C. On the grid in your Student Answer Booklet, construct a graph that shows the monthly bills for Plan 1 for between 0 and 50 minutes of calls.

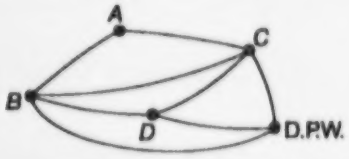
D. Using your equation or graph, find the number of minutes of phone use for which the two plans cost the same. Show or explain how you found your answer.

Figure 5. A sample 10th-grade MCAS item.

One additional class of MCAS items we could only characterize as logic problems or "puzzles." Many of these entailed mathematical content sufficiently complex that most students would end up solving them (or attempting to solve them) by trial and error rather than by applying a clear body of mathematical knowledge or skills. An example is given in Figure 6. This item is technically about

network theory, but our expectation, confirmed by our survey, was that few teachers in our sample would present it that way. When asked in an open-response question "What must a student know or be able to do in order to answer this item correctly?" 30 teachers provided answers for this item, and of those, only 3 mentioned networks or network theory in their answers. The remaining answers were highly diverse and mostly focused on generic skills or trial and error (e.g., "process of elimination," "trial and error," "problem-solving techniques," "connect points in a variety of ways until it matches the criterion," "logic.")

Item A. Use the map below to answer this question.



Mr. Hendricks operates a snowplow for the Department of Public Works (D.P.W.). He found that he can

- begin snowplowing at the D.P.W.
- plow every street shown on the map above without going over any street more than once, and
- end at his home.

Where is his home located?

A. at *A*

B. at *B*

C. at *C*

D. at *D*

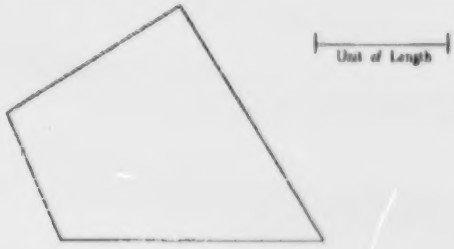
Figure 6. A sample 10th-grade MCAS item.

The NAEP items were chosen because they lacked attributes we had identified as characteristic of MCAS and had other attributes that seemed rare or entirely lacking in MCAS. For example, we noted that all of the MCAS problems involving polygons that we located entailed regular polygons and calculation rather than estimation of area or perimeter.[2] Therefore it seemed logical to include the NAEP item shown in Figure 7, which shows an irregular polygon and entails estimation.

[2] In the interviews conducted after these surveys were completed, teachers were asked "Have you noticed any important aspects of mathematics that get little or no emphasis in MCAS? If so, what are they?" A single 10th-grade teacher listed irregular polygons.

Note that the content of this item is aligned with the Massachusetts standards. That is, there is nothing in the Massachusetts Curriculum Frameworks indicating that skills should extend only to regular polygons. For example, the Mathematics Curriculum Framework lists under Exploratory Concepts and Skills for Grades 7-8: "Investigate formulas to determine the circumference and area of circles, and the perimeter and area of polygons" (Massachusetts Department of Education, 2000, p. 67).

Item E. Use the unit of length below to estimate the perimeter of the figure shown. Between which two consecutive whole-number units does the perimeter lie?

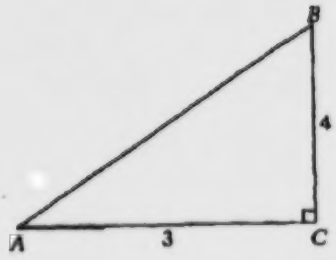


Answer: Between _____ and _____

Figure 7. A sample 8th-grade NAEP item.

Because trigonometry has been removed from the MCAS standards for Grade 10 but is a standard part of the mathematics curriculum in many schools, we decided to include a NAEP item that assessed simple trigonometry (see Figure 8). Note that reallocation away from the content of this item would not be a threat to the inferences that MCAS is designed to support, although it might be a threat to the inferences users actually draw, since many users are probably unfamiliar with the framework and assume that trigonometry is part of a typical 10th-grade mathematics curriculum. However, it is an interesting opportunity to test the extent of reallocation.

Item E.



In right triangle *ABC* above, cos *A* =

A) 3/5

B) 3/4

C) 4/5

D) 4/3

E) 5/3

Figure 8. A sample 10th-grade NAEP item.

We also included NAEP items that addressed content specifically noted in the Massachusetts Curriculum Frameworks but that lacked any particular attribute characteristic of MCAS. For example, the Massachusetts Mathematics Framework states that "In high school, students...learn to choose representative samples and identify biases in the samples and survey questions" (Massachusetts Department of Education, 2000, p. 16). We did not find many MCAS items directly addressing this, but the NAEP item in Figure 9 clearly does.

Item C. A poll is being taken at Baker Junior High School to determine whether to change the school mascot. Which of the following would be the best place to find a sample of students to interview that would be most representative of the entire student body?

A) An algebra class
B) The cafeteria
C) The guidance office
D) A French class
E) The faculty room

Figure 9. A sample 8th-grade NAEP item.

Teacher-level results. The responses to these item-based questions can be looked at in two ways: by examining the distribution of responses across teachers,

and by looking for patterns across items. In this section, we look at the former. The latter is addressed in the subsequent section.

Teachers' responses to these questions are shown in "dit plots" such as Figure 10. Dit plots, while unfamiliar to many readers, are a good way to show the entire distribution of cases when samples are small. In this figure, the scale on the X-axis represents the proportion of items a teacher reported recognizing from MCAS. Each teacher is represented in this figure by two symbols, a + and a **o**. The + indicates the proportion of NAEP items the teacher incorrectly identified as being from MCAS, and the **o** indicates the proportion of MCAS items the teacher correctly identified as being from MCAS. For example, if a teacher did not identify a single NAEP item incorrectly as coming from MCAS, that teachers + would be at a value of zero. If teachers were completely accurate, all of the + symbols would stack up at 0, and all the **o** signs would stack up at 1.0. Note that as an artifact of the way we posed these questions, teachers will seem more accurate in responding to NAEP items than in responding to MCAS items. This is because teachers who fail to recognize test items in general will tend to answer "no" when asked whether they recognize any item. Thus they will correctly not identify NAEP items as coming from MCAS but will incorrectly fail to identify MCAS items.

Teachers were able to distinguish with moderate accuracy between items that were and were not take from previous forms of MCAS, which suggests that they pay substantial attention to the details of the test. Most of the 8th-grade teachers did not identify any of the NAEP items as coming from MCAS (see Figure 10). They less commonly recognized actual MCAS items. For example, four teachers recognized roughly two thirds of the MCAS items, and six recognized fewer. Grade 10 teachers appear to differentiate slightly less successfully between MCAS and NAEP items (see Figure 11), but the small numbers of teachers and items makes this uncertain.

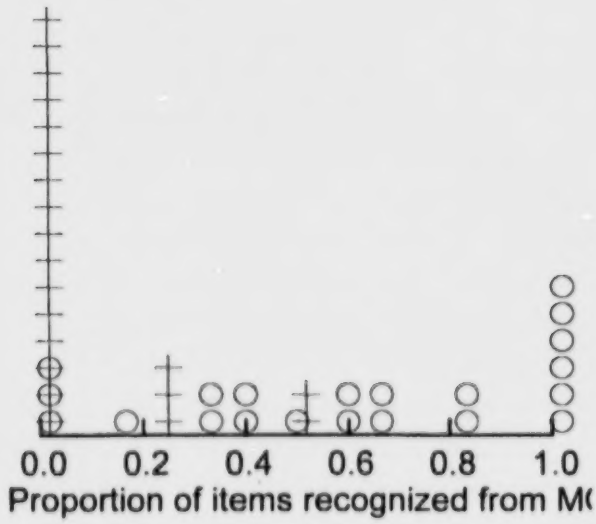


Figure 10. Proportion of items "recognized" as being from MCAS by each teacher, Grade 8 (+ symbol indicates NAEP items; o symbol indicates MCAS items).

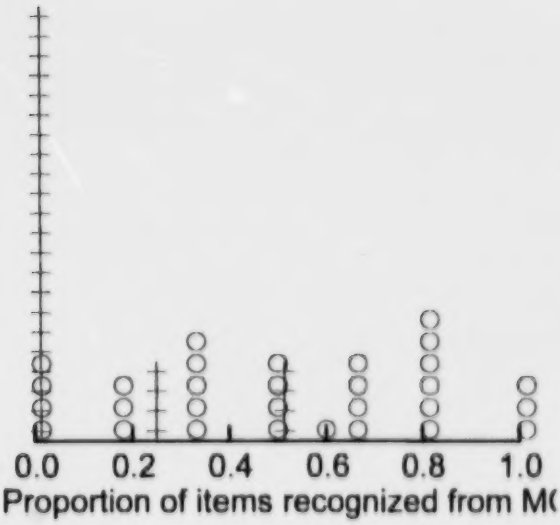


Figure 11. Proportion of items "recognized" as being from MCAS by each teacher, Grade 10 (+ symbol indicates NAEP items; o symbol indicates MCAS items).

If teachers attempt to reallocate their instruction to align it better with the content of test items, the alignment of their instruction to previous test items will presumably vary. Accordingly, we allowed teachers two positive responses when we asked if they taught the content of sampled items: "I teach this content," and "I teach similar content but not exactly this." In analysis, we initially kept the first response separate and then combined it with the second. Here we call the first "teach the same content" and the combined first and second "teach the same or similar content." Because of uncertainty about teachers' instructional responses to the test and about their characterization of their responses (just how similar does the content have to be before it is "this content" rather than "similar content?"), it is not clear *a priori* which of these two variables is likely to be more sensitive to reallocation.

Considering first the "teach the same content" responses, eighth-grade teachers showed some degree of differentiation in their teaching emphasis between NAEP and MCAS items, which may be a sign of reallocation in response to the test. The mean proportions of items for which teachers reported teaching the same content was 56% for MCAS items and 30% for NAEP items. About 40% of the teachers said that they taught the content of none of the NAEP items, and almost three fourths said that they taught the content of either none or only one of them. This is shown in Figure 12, which is similar to the previous two figures: the X-axis indicates the proportion of items in response to which the teachers said they taught the same content, and each teacher is represented by two symbols, one for MCAS items and the other for NAEP items. The responses about MCAS items were more diverse. Only a single teacher reported teaching the same content as was reflected in all six of the MCAS items, but half of the teachers reported teaching the content of at least four of the six items, and three-fourths of the teachers reported teaching the content of half or more of the items.

A similar differentiation of teaching appeared in the 10th-grade. On average, teachers reported teaching the same content as was shown in 49% of the MCAS items and 26% of the NAEP items. However, 10th-grade teachers were less likely than 8th-grade teachers to report teaching the same content as was shown in most of the MCAS items (Figure 13). Only about one fourth of the teachers reported teaching the same content as was reflected in four or more of the six MCAS items. Here again, the small number of cases makes the meaningfulness of this difference between grades unclear.

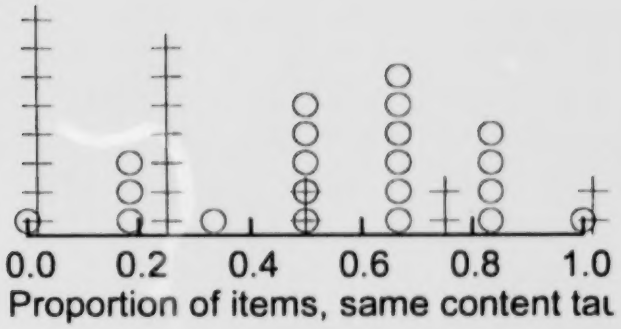


Figure 12. Proportion of items for which each teacher reported she taught the same content, Grade 8 (+ symbol indicates NAEP items; o symbol indicates MCAS items).

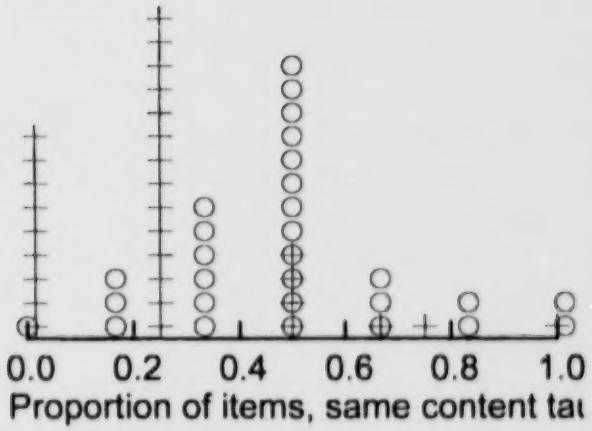


Figure 13. Proportion of items for which each teacher reported she taught the same content, by teacher, Grade 10 (+ symbol indicates NAEP items; o symbol indicates MCAS items).

Considering whether teachers teach the same or similar content, rather than just the same content, did not substantially change the differentiation between MCAS and NAEP items, but using this measure, differentiation appeared slightly weaker among 10th-grade teachers. In the 8th grade, the average teacher reported teaching the same or similar content for 78% of MCAS items and 48% of NAEP items. In the 10th grade, the means were 69% for MCAS items and 50% for NAEP items.

Item-level results. In this section, the responses to teachers to the item-based questions are tabulated by item, rather than by teacher. For example, rather than calculating for each teacher the proportion of items correctly recognized as coming from MCAS, we calculated for each item the proportion of teachers who correctly identified it. We then plotted the distribution of these percentages across all items.

Examining the responses by item showed more clearly the ability of many teachers to distinguish between MCAS and NAEP items. Figure 14 shows the percentage of teachers in both grades that responded that they recognized each sampled test item as coming from MCAS. In this and the following figures, each symbol represents a single item rather than a single teacher—in this case, the proportion of teachers reporting that they recognized that particular item as having come from MCAS. Therefore, each observation (i.e., each item) is given only one symbol, rather than two: a + symbol if the item was taken from NAEP, and a o symbol if the item was drawn from an earlier MCAS test. If teachers were perfectly accurate in identifying the source of items, all of the + symbols would be stacked at zero (all NAEP items would be "recognized" by no teachers as coming from the MCAS), while all of the o symbols would be stacked at 100 (all MCAS items would be correctly recognized by all teachers). Thus, for example, the right-most + symbol in this figure indicates that one NAEP item was incorrectly identified as an MCAS item by 24% of teachers. A few NAEP items were incorrectly identified by a modest percentage of teachers, and a number of MCAS items were not successfully identified by substantial percentages of teachers. Nonetheless, the two distributions are non-overlapping: all NAEP items were identified as coming from MCAS less often than the least frequently identified MCAS item. Contrary to our expectations, eighth-grade teachers were slightly more able to differentiate the two sets of items, but with so few teachers in the sample and so few items in the questionnaire, this may be a matter of chance.

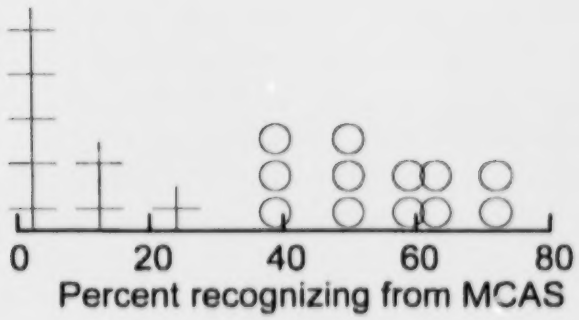


Figure 14. Percent of teachers claiming to recognize each sample test item as coming from MCAS, both grades (+ symbol indicates NAEP items; o symbol indicates MCAS items).

The items that were recognized by the largest proportions of teachers tended to be ones that the authors identified as being particularly characteristic of MCAS. At the 10th grade, the cell phone billing item depicted in Figure 5 and the "puzzle" item depicted in Figure 6 were the most widely recognized (70% and 63% of teachers, respectively). Among Grade 8 teachers, the most frequently recognized items were a spatial-visualization task similar to that shown in Figure 3 (recognized by 71% of teachers), the geometric series item shown in figure 4 (62%), and the unconventional algebra problem shown in Figure 2 (62%). Thus it appears that teachers are aware of some of the features that characterize MCAS items.

Tabulating responses by item is consistent with the earlier tabulations by teacher in providing some indication of reallocation in the eighth grade, but the evidence was weak in the 10th grade. In the eighth grade, the content of most NAEP items was taught by only a small percentage of teachers, while the content of most MCAS items was taught by larger percentages of teachers (Figure 15). Some of the differences were small, however, and two items were out of order. In contrast, in the 10th grade, where one might expect stronger instructional responses because of higher stakes, the pattern was weaker: of the 10 items in the survey, only 2 MCAS items stood out from the other MCAS and NAEP items (see Figure 16).

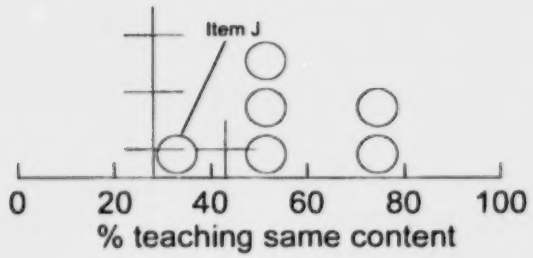


Figure 15. Percent of teachers teaching the same content as in each sample test item, Grade 8 (+ symbol indicates NAEP items; o symbol indicates MCAS items).

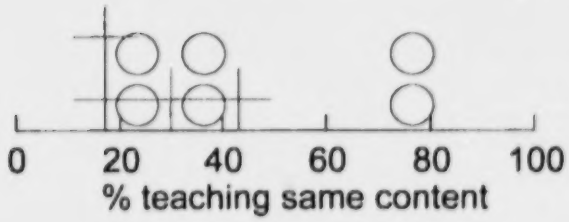


Figure 16. Percent of teachers teaching the same content as in sample test items, by item, Grade 10 (+ symbol indicates NAEP items; o symbol indicates MCAS items).

When the percentage teaching the same or similar content was examined, the patterns changed, but differentiation between MCAS and NAEP items remained modest. In grade 8, three MCAS items were more often taught than other items; two NAEP items were taught less frequently; and two MCAS and one NAEP item were taught by roughly similar percentages of teachers (Figure 17). Again there was less differentiation in grade 10, where only two MCAS items and one NAEP item stood out from the others.

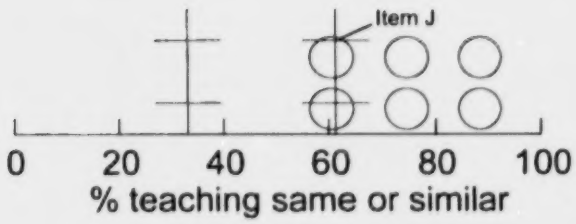


Figure 17. Percent of teachers teaching the same or similar content as in sample test items, grade 8 (+ symbol indicates NAEP items; o symbol indicates MCAS items).

While the teacher-based and item-based displays showed roughly similar patterns in terms of differentiating teachers' responses to MCAS and NAEP items, the item-based display has the advantage of permitting analysis of specific test items. Variations between items in teachers' responses to a test may be central to evaluating the validity of gains. For example, the MCAS item the content of which the fewest eighth-grade teachers said they taught (Item J in Appendix) is an unusual and easily remembered item. It is a long algebra item with eight separate parts in which the unknowns (units of currency) are represented by unusual symbols (polygons with letters in them). Both authors considered this type of item to be characteristics of MCAS. Another item of this type, however, might employ a different, if also unusual, representation, so some teachers might characterize their preparation for this item as teaching "similar" content. In fact, about a fourth of eighth-grade teachers said they taught content similar to that in Item J. Yet when we examined the percentage of teachers teaching content the same as or similar to that in test items, Item J was still one of the MCAS items that received the least reported instructional focus (see Figure 17).

Reasons for teaching content of items. For each test item, teachers who said they taught the content of the item were directed to a set of questions that asked the reasons for teaching it and whether their emphasis would change in the absence of MCAS. Teachers who said they did not teach the content were directed to a different set of questions that probed their reasons for not teaching it. The small numbers of respondents for these questions, and the fact that the numbers vary across test items depending on the frequency with which teachers reported teaching the content, makes these responses difficult to interpret. Nonetheless they suggest some possible evidence of reallocation and are worth examining, even though any conclusions must be quite tentative. We only examine the responses to the questions that

teachers answered if they did report teaching the content, because the sample sizes for the others were prohibitively small.

The first question asked teachers to select the reasons why they taught the content of the test item. Teachers were asked to select as many of the five reasons as applied. Table 12 summarizes the results for 8th-grade teachers, and Table 13 provides the same information for 10th-grade teachers. The second column in Tables 12 and 13 gives the percentage of teachers responding in the affirmative for each of the reasons, averaged across the six MCAS items. These numbers include only those teachers who reported teaching the content *and* who recognized the item from either MCAS or test-preparation materials. The third column gives the corresponding percentages for the four NAEP items and includes only those teachers who reported teaching the content *and* who either did not recognize the item or who recognized it from another test.

Table 12

Percentages of Teachers Who Reported Reasons for Teaching the Content of MCAS and NAEP Items, Grade 8

	MCAS Items	NAEP Items
It is part of the curriculum for this grade and course.	52	66
It is not part of the curriculum for this grade and course, but I include it as review or to help students learn other material included in the curriculum.	17	34
It helps students do well on MCAS.	46	20
It helps students do well on other tests.	14	24
It is preparation for more advanced mathematics courses.	10	12

Table 13

Percentages of Teachers Who Reported Reasons for Teaching the Content of MCAS and NAEP Items, Grade 10

	MCAS Items	NAEP Items
It is part of the curriculum for this grade and course.	72	85
It is not part of the curriculum for this grade and course, but I include it as review or to help students learn other material included in the curriculum.	11	17
It helps students do well on MCAS.	48	17
It helps students do well on other tests.	20	21
It is preparation for more advanced mathematics courses.	25	25

In both grades, teachers were more likely to include "It helps students do well on MCAS" among their reasons for teaching MCAS items than they were for NAEP items, but some teachers did give this response for at least some of the NAEP items. Tenth-grade teachers were more likely to report teaching content than were 8th-grade teachers because it is in the curriculum, which is consistent with some of the results reported earlier that suggested a stronger reliance on the curriculum among 10th-grade teachers.

Another question asked teachers whether they made reference to MCAS when they taught the content of the test items. Tables 14 and 15 list the response options and the percentages of teachers who selected each, averaged over all MCAS items (second column) and over all NAEP items (third column). The MCAS column includes only teachers who reported teaching the content of the item *and* who recognized the item from MCAS or test-preparation materials. The NAEP column includes only those who reported teaching the content *and* who either did not recognize the item or who recognized it from another test. Table 14 provides results for 8th-grade teachers, and Table 15 for 10th-grade teachers.

Table 14

Percentages of Teachers Who Said They Referred to MCAS While Teaching Item Content, Grade 8

	MCAS Items	NAEP Items
No reference	18	53
Tell students this general content is likely to be included in MCAS	58	33
Tell students an item like this one is likely to be included in MCAS	24	14
Tell students this general content is not likely to be included in MCAS	0	0
Tell students items like this one are not likely to be included in MCAS	0	0

Table 15

Percentages of Teachers Who Said They Referred to MCAS While Teaching Item Content, Grade 10

	MCAS Items	NAEP Items
No reference	19	60
Tell students this general content is likely to be included in MCAS	45	32
Tell students an item like this one is likely to be included in MCAS	34	11
Tell students this general content is not likely to be included in MCAS	5	0
Tell students items like this one are not likely to be included in MCAS	0	0

At both grades, teachers were more likely to report making no reference to MCAS when they taught the content of NAEP items than when they taught the content of MCAS items, providing additional evidence that teachers distinguish between material that is and is not represented in MCAS and that this distinction influences their instruction. However, teachers sometimes did refer to MCAS when presenting content from NAEP items, even though we selected NAEP items that did not resemble any items that had been included in MCAS tests. These results also indicate that teachers rarely explicitly told students that material would not be included in MCAS; instead, they simply did not present it.

The final question in this section asked teachers whether they would change their emphasis on the content of the test item if students did not have to take MCAS. For present purposes, tabulations of these questions served two purposes. First, they provide a way of assessing reallocation without measuring it directly: Presumably teachers who say they would change their emphasis on a topic if MCAS were not a consideration are suggesting that MCAS has influenced their instructional choices with respect to that topic. Second, these tabulations provide an indication of whether item-based questions of this sort can successfully capture teachers' changes in emphasis in response to a high-stakes test. Tables 16 and 17 present the results, averaged across items, for the same groups of teachers included in Tables 15 and 16 above. Table 16 shows fairly consistent but modest evidence of reallocation among 8th-grade teachers, with higher percentages reporting that they would decrease

Table 16

Percentages of Teachers Who Said They Would Change Their Emphasis if Students Did Not Have to Take MCAS, Grade 8

	MCAS Items	NAEP Items
Decrease substantially	22	0
Decrease slightly	20	14
Would not change	53	82
Increase slightly	10	14
Increase substantially	0	0

Table 17

Percentages of Teachers Who Said They Would Change Their Emphasis if Students Did Not Have to Take MCAS, Grade 10

	MCAS Items	NAEP Items
Decrease substantially	13	0
Decrease slightly	12	13
Would not change	72	91
Increase slightly	4	0
Increase substantially	0	6

emphasis on MCAS items than those who would on NAEP items. There was little evidence of this phenomenon in 10th grade, a finding that is probably related to the greater curricular constraints on 10th grade teachers. Together, the responses to these questions suggest some modest reallocation, particularly in the 8th grade. More information would be needed to understand whether these findings generalize to a broader range of content and whether it would be possible to refine the questions to obtain better information on the nature of the reallocation.

Inspection of responses to this set of questions for specific items illustrates some of the ways that teachers attend to specific types of test items. In the 10th grade, there were two items for which teachers chose the option, "It helps students do well on MCAS" as a reason for teaching the content of the item. One of them was Item A, depicted in Figure 6. More than two thirds of teachers reported that this item was helpful for MCAS, whereas only 44% said it was part of the curriculum—less than for any other MCAS or NAEP item on this survey. The other item was Item J, shown in Figure 18 below. This item asked students to determine which of four expressions yielded a negative result. Although nearly as many teachers (62%) said this item

Which of the following yields a **negative** result?

A. $(^{-}5)^{16}$

B. $(6 - 9)(^{-}4 + 2)$

C. $^{-}3(^{-}4)^{9}$

D. $^{-}2^{9}$

Figure 18. 10th-Grade MCAS Item J.

helped students do well on MCAS as gave this response for Item A, Item J differed from Item A in the number who said it was part of the curriculum: 100 percent of responding teachers gave this response. This difference is evident in teachers' responses to the question about whether they would increase or decrease their emphasis in the absence of MCAS: 58% said they would decrease their emphasis either slightly or substantially on Item A, whereas only 8% gave these responses for Item J. Responses to the question about whether teachers make reference to MCAS when teaching the item were similar: 100% said they told students that the content of Item A or an item similar to Item A would be included in MCAS, and 93% gave these responses for Item J. It is clear from this discussion that teachers are aware that certain items are characteristic of MCAS, and that their decisions about whether to teach them are determined in part but not fully by the items' inclusion in MCAS.

Relationships with general responses to MCAS. In this section we discuss descriptive analyses that we conducted to investigate whether teachers' responses to the item-based questions showed the expected relationships with one another and with some of the other information collected through the surveys. We have insufficient data to investigate these relationships in detail, and as we discussed earlier, none of our results should be interpreted as indicative of relationships that might be found in a larger or more representative sample of teachers. These analyses are purely exploratory, and as with other material presented here, are intended to provide guidance for future data collection efforts.

Table 18 presents correlations among the proportions of MCAS and NAEP items recognized and taught, with correlations for 8th-grade teachers above the main diagonal and those for 10th-grade teachers below it. We hypothesized that teachers who were more accurate at recognizing MCAS items would be less likely than other teacher to incorrectly attribute NAEP items to MCAS, which would produce a negative correlation between "MCAS recognize" and "NAEP recognize." We did

Table 18

Correlations Among Proportions of Items Recognized and Taught (Grade 8 Above Diagonal and Grade 10 Below Diagonal)

	MCAS recognize	NAEP recognize	MCAS teach	NAEP teach
MCAS recognize	1.00	.20	.19	-.02
NAEP recognize	.20	1.00	-.06	-.31
MCAS teach this	.22	.12	1.00	.39
NAEP teach this	-.10	-.08	.27	1.00

not see evidence of this expected relationship; on the contrary, the correlations were positive but very small (.20) in both grades. Similarly, we wanted to explore whether the proportion of MCAS items taught was negatively related to the proportion of NAEP items taught. Again, the correlations were positive: r=.4 in the 8th grade and r=.3 in the 10th grade. These unexpected positive relationships could stem from any of several causes, and larger studies would be needed to disentangle them. For example, the modest positive correlations between reporting that one teaches MCAS items and NAEP items could reflect teaching styles (some teachers may cover a broader range of content than others and therefore tend to answer "yes" to more item-based questions) or response bias, as well as simple sampling error resulting from our very small samples.

Next we examined relationships between the item-based questions and teachers' reliance on test-preparation activities. Positive relationships between these sets of questions would provide support for the validity of teachers' responses, in that concern with tailoring instruction to the MCAS could lead teachers both to attend to earlier MCAS items and to use MCAS-related test-preparation materials. Table 19 presents results for 8th grade, and Table 20 provides the 10th-grade results. We examined fewer test-preparation resources in 8th than in 10th grade because many of the resources were used by very few 8th-grade teachers (see Tables 5 and 6). At both grades, use of test-preparation materials tended to be positively correlated with proportion of MCAS items recognized, and nearly uncorrelated with proportion of NAEP items recognized. An exception to the latter finding was the correlation of .36 between NAEP items recognized and use of other (i.e., non-MCAS) commercial test-preparation materials at 10th grade. This is not surprising, as the use of materials not developed for MCAS probably provides teachers with exposure to a broader range of test item types than they would get from MCAS-specific materials, but it suggests that teachers who use non-MCAS materials may not be aware of the

Table 19

Spearman Correlations Between Item-Level Responses and Use of Test-Preparation Resources, Grade 8

	Use of old MCAS items	Use of other sample MCAS items	Use of MCAS scoring rubrics
MCAS recognize	.57	.45	.44
NAEP recognize	.06	-.10	.01
MCAS teach this	.33	.32	.26
NAEP teach this	.21	.05	-.07

Table 20

Spearman Correlations Between Item-Level Responses and Use of Test-Preparation Resources, Grade 10

	Use of old MCAS items	Use of other sample MCAS items	Use of MCAS scoring rubrics	Princeton Review's *Cracking the MCAS*	Other commercial test-prep materials
MCAS recognize	.53	.20	-.03	.19	.12
NAEP recognize	.13	.14	-.03	.02	.36
MCAS teach this	.16	.24	.12	.08	.05
NAEP teach this	.02	-.12	-.06	-.24	-.01

differences between MCAS items and other test items. Relationships with the proportions of items taught were mixed, but generally positive for MCAS and negative or close to zero for NAEP.

Finally, we examined correlations between the item-based questions and teachers' responses to the question regarding ways in which their teaching is affected by MCAS (see Tables 8 and 9 above for summaries of responses to this question). In this case as well, relationships among responses to these questions could provide convergent evidence of the validity of teachers' responses. However, the relationships are inconsistent between the two grade levels (see Tables 21 and 22) and generally do not provide convergent evidence of validity. Larger samples would be needed to ascertain whether these patterns reflect sampling error or limitations of these forms of questions. One consistent pattern that warrants additional exploration is that teachers who reported focusing on the Massachusetts content standards did not show any tendency to recognize more MCAS items or to report teaching the content of MCAS items. In addition, in both grades, these

Table 21

Spearman Correlations Between Item-Level Responses and Changes to Teaching, Grade 8

	Focus more on MA Content Standards (c)	Shift among topics of math curriculum to focus on material in MCAS (d)	Emphasize writing with mathematics (l)	Look for problem styles and formats in MCAS (g)	Spend more time on math test-taking strategies (i)
MCAS recognize	.08	.31	.39	.16	.43
NAEP recognize	.39	.33	-.08	.20	.25
MCAS teach this	-.09	.42	.16	.15	.19
NAEP teach this	.15	.07	.02	.22	.03

Table 22

Spearman Correlations Between Item-Level Responses and Changes to Teaching, Grade 10

	Focus more on MA Content Standards (c)	Shift among topics of math curriculum to focus on material in MCAS (d)	Emphasize writing with mathematics (l)	Look for problem styles and formats in MCAS (g)	Spend more time on math test-taking strategies (i)
MCAS recognize	-.20	.02	-.03	-.08	.08
NAEP recognize	.42	.08	.26	.27	.58
MCAS teach this	.08	-.02	-.08	.11	.42
NAEP teach this	.01	-.29	-.18	-.21	.18

teachers were more likely to label NAEP items incorrectly as coming from MCAS. This raises the possibility that in the behavior of some teachers, focusing on standards and focusing on the test used to implement them may be distinct and independent.

Content-Based Questions

The final section of the survey was similar to the third, but instead of presenting test items, we selected seven specific content categories that were classified as having either high or low representation on MCAS.

In contrast to the responses to the questions about test items, responses to questions about content areas differentiated only inconsistently between high- and low-MCAS categories. In the eighth grade, the large majority of teachers reported teaching the content of 4 of the 5 content areas that we found stressed in the MCAS forms we examined (see Table 23). However, only about half reported teaching the

content of the fifth area stressed in MCAS (transformations), and 55% and 86% reported teaching the content of the two NAEP content areas that we found not to be stressed in the MCAS (proportional thinking and systems of equations). In the 10th grade, the large majority of teachers reported teaching the content of two of our content areas stressed in the MCAS, but two others were essentially no different from two of the areas not stressed in the MCAS (see Table 24). We return to these ambiguous results in the Discussion section below.

Table 23

Percentages of Teachers Reporting That They Teach Specific Content Categories, Grade 8 (*N* in Parentheses)

	No, I don't teach this content	I teach this content	I teach similar content but not exactly this	I teach this content and teach similar content
High-MCAS				
B (percentages)	0	95 (20)	0	5 (1)
C (perimeter and area)	0	95 (20)	0	5 (1)
D (transformations)	29 (6)	48 (10)	14 (3)	10 (2)
E (measuring angles)	0	90 (19)	5 (1)	5 (1)
F (extending patterns)	5 (1)	85 (17)	5 (1)	5 (1)
Low-MCAS				
A (proportional thinking)	5 (1)	86 (18)	10 (2)	0
G (systems of equations)	30 (6)	55 (11)	5 (1)	10 (2)

Table 24

Percentages of Teachers Reporting That They Teach Specific Content Categories, Grade 10 (*N* in Parentheses)

	No, I don't teach this content	I teach this content	I teach similar content but not exactly this	I teach this content and teach similar content
High-MCAS				
A (transformations)	27 (8)	47 (14)	23 (7)	3 (1)
C (measuring angles)	7 (2)	80 (24)	10 (3)	3 (1)
D (extending patterns)	7 (2)	83 (25)	3 (1)	7 (2)
F (factoring equations)	60 (18)	33 (10)	7 (2)	0
Low-MCAS				
B (proportional thinking)	3 (1)	39 (28)	3 (1)	0
E (basic trigonometry)	66 (19)	34 (10)	0	0
G (complex figures)	20 (6)	67 (20)	10 (3)	3 (1)

Discussion

This study was undertaken to explore whether surveys can be made useful for identifying the types of responses to high-stakes testing that Koretz et al. (2001) maintained are a key to evaluating the validity of score gains.

Simply describing in survey questions the categories of responses outlined by Koretz et al. (2001) appears to be inadequate. We found it extremely difficult to describe the relevant categories of responses clearly in the context of short survey questions, and our interviews with respondents suggested that many teachers could not clearly understand the distinctions we were trying to make.

Survey questions based on the content areas specified in test frameworks might in theory function better than these general question because they add specificity, but our questions based on content areas also appeared to be relatively ineffective. Simple verbal descriptions of content areas did not enable teachers in our sample to differentiate consistently between the areas emphasized on the test and those given less emphasis. Questions based on content areas would also be limited in application even if they were more effective because they cannot be used to pinpoint aspects of item style or non-substantive elements that could be leverage points for coaching.

Questions based on actual test items seem to be the most promising of the approaches tried here. Most teachers reported placing moderate to great emphasis on old test items in preparing students for the test, and in responses to our surveys, they showed a moderately good ability to differentiate between MCAS items and NAEP items. Several relationships between responses to item-based questions and other questions offer support for the validity of the item-based questions. Moreover, item-based questions can be used to explore a variety of aspects of a high-stakes test, including both content and many aspects of item style, such as format of presentation. Accordingly, these questions may be useful for exploring various forms of coaching as well as reallocation.

A potentially major limitation of all of the approaches explored here is that they are not designed to address instructional decisions made by people other than classroom teachers. The questions explored in this study were predicated on the assumption that teachers make decisions about how to align instruction with the high-stakes test and therefore should be able to describe the aspects of the test on which they focus their instruction. We were surprised by the frequency with which the teachers in our sample reported that they had little flexibility to modify their

instruction in response to the high-stakes test. To the extent that other parties, such as district administrators, make key decisions about alignment, it will be necessary to modify the methods explored here and supplement them with others designed to capture the decisions made by other parties.

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APPENDIX

BOSTON PUBLIC SCHOOLS, GRADE 8
STUDY BACKGROUND

This questionnaire and the associated telephone interview are part of an ongoing effort to strengthen the evaluation of high-stakes testing programs.

NOTE: This survey is shorter than it appears. It includes considerable blank space (because of formatting), and numerous questions that you will be asked to skip (depending on your answers to other questions). In several cases, we ask you one set of questions repeatedly, with each repetition focused on a specific test item or content area. After the first few repetitions, you will find these sections easier to fill out quickly. Teachers who pilot-tested this survey completed it in 40 to 60 minutes.

Although your district has approved the study, the study is not being conducted for the district or for the state department of education. This is an independent study conducted by researchers at the Harvard Graduate School of Education and RAND, in their role as partners in the Center for Research on Evaluation, Standards, and Student Testing (CRESST).

This study is not an evaluation of teachers or schools. We will not share your responses with anyone, including school or district personnel. We will ask for your name, but this is solely for logistical purposes, such as linking this form to your interview and mailing you your honorarium check. Identifying information will be destroyed once those needs are met.

This is a pilot study designed to test and evaluate methods of obtaining information from teachers about their responses to high-stakes testing programs. To the extent that these methods are successful, we expect to use them in future, large-scale studies of high-stakes testing programs.

We will ask you a variety of questions about your responses to the MCAS testing program. We will also ask you to evaluate some aspects of our survey questions and provide feedback to help us improve them.

Please keep this questionnaire after you have filled it in as a reference for your interview. When you have completed the interview, please mail this questionnaire back to us in the attached stamped envelope. When you have completed both this questionnaire and the telephone interview, we will mail you an honorarium of $100 as a gesture of appreciation for your time and effort.

Substantive questions can be sent to the study directors, Daniel Koretz (daniel_koretz@harvard.edu, 617-384-8090) or Laura Hamilton (Laura_Hamilton@rand.org, 310-393-0411 x 6146). Because of travel schedules, we strongly urge you to use e-mail if possible.

Thank you very much for taking the time to share your expertise with us.

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General instructions:

This survey includes three types of questions:

- A few questions ask you to write in an answer.
- A few questions ask you to choose all appropriate choices from a list. All of these questions specifically note that in their directions.
- All other questions should be answered by selecting the single best answer from among the available choices.

You should indicate your answer(s) by checking the box by the choice or by circling the number where there is no box.

In some cases, you may find that the phrasing of a question or the choice of responses is not optimal to describe your responses to MCAS. Please make notes about these cases as you fill out the survey. During your phone interview, you will be asked to note any questions that you found particularly problematic. Your feedback about these questions will be used to revise this survey for future use in evaluating high-stakes testing programs.

background information

This information will be used only to complete data collection and will be destroyed once interviews have been linked to this survey instrument. No identifying information will be retained or displayed.

Name: _____

District: _____

Preferred phone number for interview: _____

Alternative phone number for interview: _____

Address for mailing survey forms and honorarium check:

_____

_____

_____

E-mail address: _____ (will be used only for scheduling, etc.)

Social security number _____

Your SSN is required for us to pay your honorarium and will not be used for any other purpose.

1. How many periods of mathematics do you teach on a typical day? _____

2. Please list the title(s) of the classes you teach (e.g., algebra, pre-algebra).

_____

3. If you teach eighth-grade mathematics to more than one class, please respond to this questionnaire based on your experiences in the first eighth-grade mathematics class of the day. We refer to this as your "target" class. What type of course is your target class? (e.g., algebra, pre-algebra, etc.)

_____

4. How does the math achievement of this school compare to that of other schools in the state?

- ❒ 1. Substantially below average
- ❒ 2. Moderately below average
- ❒ 3. About average
- ❒ 4. Moderately above average
- ❒ 5. Substantially above average

5. How does the math achievement of the class about which you will respond compare to that of other classes in this school?

- ❒ 1. Substantially below average
- ❒ 2. Moderately below average
- ❒ 3. About average
- ❒ 4. Moderately above average
- ❒ 5. Substantially above average

general responses to MCAS

1. How much pressure do you feel to improve your students' scores on the MCAS Mathematics test?

- ❒ 1. None
- ❒ 2. A small amount
- ❒ 3. A moderate amount
- ❒ 4. A great deal

2. How well is MCAS aligned with the curriculum for this course in your school?

- ❒ 1. Poorly, because MCAS includes considerable material that is not in our curriculum
- ❒ 2. Poorly, because MCAS omits considerable material that is in our curriculum.
- ❒ 3. Fairly well, although the overlap is not complete.
- ❒ 4. Very well.

3. How much emphasis do you place on each of the following resources to help students do well on the MCAS Mathematics test?

	No emphasis	Slight emphasis	Moderate emphasis	Great emphasis
a. Old MCAS items	1	2	3	4
b. Other sample MCAS test items	1	2	3	4
c. MCAS scoring rubrics	1	2	3	4
d. The Princeton Review's *Cracking the MCAS*	1	2	3	4
e. The MCAS2003.com web site	1	2	3	4
f. The BPS "Tool Kit"	1	2	3	4
g. Other commercial test-prep books or materials	1	2	3	4
h. Other DOE or BPS test-preparation materials	1	2	3	4

4. If you give moderate or great emphasis to any test preparation materials other than those listed in 2(a) through 2(f) in the preceding question, please list the materials you use most.

_____

_____

_____

_____

_____

_____

_____

5. How much flexibility do you have to modify your curriculum and instruction in response to MCAs?

- ☐ 1. Very little because my school or district requires me to adopt a specific curriculum.
- ☐ 2. Very little, but for some other reason. Specify:

  _____
- ☐ 3. A moderate amount.
- ☐ 4. A great deal.

6. Please think about ways in which your teaching is different because of MCAS than it would be without MCAS. Indicate the extent to which any of the following statements characterizes those differences. In your phone interview, we will ask you for additional detail about some of these questions.

	Not at all	Somewhat	A great deal
a. I assign more homework or more difficult homework.	1	2	3
b. MCAS has prompted me to find more effective teaching methods (more effective in general, not specifically targeted to MCAS).	1	2	3
c. I focus more on the Massachusetts Curriculum Framework Content Standards in mathematics.	1	2	3
d. I shift emphasis among topics or strands of the mathematics curriculum to focus more on material emphasized in MCAS (e.g., shifting instructional time from coordinate geometry to plane geometry or vice-versa).	1	2	3
e. I shift emphasis from other mathematics material <u>not in the local curriculum</u> to focus more on material emphasized in MCAS.	1	2	3
f. I look for patterns in the ways that MCAS presents a given type of content and emphasize those in my instruction. (e.g., using coordinate geometry to present algebra problems)	1	2	3
g. I look for particular styles and formats of problems in MCAS and emphasize those in my instruction. (e.g., using unusual pictures or symbols to present algebra problems; using specific key phrases)	1	2	3
h. I focus more on the aspects of performance that are stressed by the MCAS scoring rubrics.	1	2	3
i. I place more stress than I would on mathematics test-taking strategies, such as "plugging in" and "process of elimination."	1	2	3
j. I spend more time teaching and encouraging generic test-taking strategies such as time management or eating a good breakfast.	1	2	3
k. I spend more time teaching mathematics content (e.g., by replacing non-instructional activities with instruction on mathematics).	1	2	3
l. I place a greater emphasis on writing with mathematics.	1	2	3

7. TO WHAT EXTENT DID YOUR SCHOOL'S MCAS SCORES RISE BETWEEN SPRING 2000 AND SPRING 2001?

- ❒ 1. Not at all
- ❒ 2. A small amount
- ❒ 3. A moderate amount
- ❒ 4. A great deal
- ❒ 5. Don't know

IF "NOT AT ALL" OR "DON'T KNOW", SKIP THE NEXT ITEM.

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8. Below are some factors which may have contributed to the score gain that occurred in your school. For each, please circle the number indicating the extent to which you think it contributed to score improvements. Please circle only one number in each row.

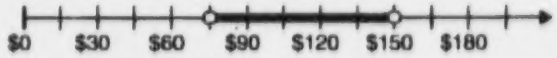
	Not at all	A small amount	A moderate amount	A great deal	Don't know
a. Improved test-taking skills	1	2	3	4	9
b. Increased student motivation	1	2	3	4	9
c. Differences between student cohorts from year to year	1	2	3	4	9
d. Broad improvements in students' knowledge and skills	1	2	3	4	9
e. Improvements in students' mastery of knowledge and skills that are emphasized in MCAS	1	2	3	4	9
f. Increased familiarity with the MCAS assessments	1	2	3	4	9
g. Work with practice tests and other preparation materials	1	2	3	4	9

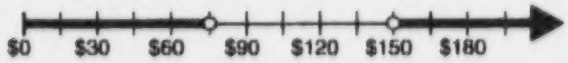
questions about test items

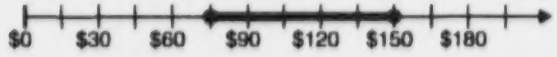
In this section, we will ask you a series of questions about several mathematics test items. You will be asked to skip some questions based on your response to the first question following each item. The arrows will show you where to go.

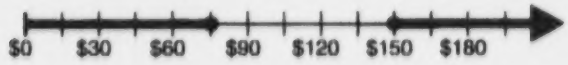
NOTE: When we use the term "content," it refers to the knowledge AND the skills needed to answer a given test item.

Item A. Imelda will work 10 to 20 hours per week at her new job and will be paid $7.50 per hour. Which of the following shows how much she can earn per week?

A. 

B. 

C. 

D. 

A1. Do you recognize this test item?

- ☐ 1. No
- ☐ 2. Yes, from MCAS
- ☐ 3. Yes, from another test

  Which test? _____
- ☐ 4. Yes, from test-preparation materials, a textbook, or other instructional materials

  Which materials? _____
- ☐ 5. Yes, but I'm not sure where I've seen it.

A2. What must a student know or be able to do in order to answer this item correctly? Please briefly note the skill or knowledge you consider most essential. (e.g., "must be able to do simple computations with exponents.")

_____

_____

_____

A3. Do you teach content of this test item in this class?

- ☐ 1. No, I don't teach this content. **Continue to question A4.**
- ☐ 2. I teach this content. **Skip to question A6.**
- ☐ 3. I teach similar content but not exactly this (e.g., "I teach area, but only with regular polygons"). **Skip to question A6.**

If you answered "no" to question A3, continue to question A4. Otherwise, skip to question A6.

A4. Why do you not teach this content?

- ☐ 1. It is not in the curriculum.
- ☐ 2. It is taught in an earlier grade.
- ☐ 3. It is taught in a later grade.
- ☐ 4. It is in the curriculum, but it is not an important topic.
- ☐ 5. It is in the curriculum but it is not emphasized or included in MCAS.
- ☐ 6. Other reason (please specify)

_____

_____

A5. Would you change your emphasis on the content of this item if your students did not have to take MCAS?

- ☐ 1. I still would not teach it.
- ☐ 2. I would give it slight emphasis
- ☐ 3. I would give it substantial emphasis

Go to Item B.

A6. For which of the following reasons do you teach the content of this test item? **(Select as many as apply.)**

- ☐ 1. It is part of the curriculum for this grade and course
- ☐ 2. It is not part of the curriculum for this grade and course, but I include it as review or to help students learn other material included in the curriculum.
- ☐ 3. It helps students do well on MCAS.
- ☐ 4. It helps students do well on other tests.
- ☐ 5. It is preparation for more advanced mathematics courses

A7. How much emphasis do you give to the content of this test item?

- ☐ 1. It is taught in one lesson; not the primary focus of that lesson.
- ☐ 2. It is the primary or sole focus of a single lesson.
- ☐ 3. It is the primary or sole focus of two lessons.
- ☐ 4. It is taught over an extended period of time (e.g., woven through an investigation).

A8. Which of the following best characterizes the way you teach this content?

- ☐ 1. I have presented this test item
- ☐ 2. I present problems with similar content and similar format
- ☐ 3. I present problems with similar content that do not resemble this test item
- ☐ 4. I present this content in the context of other topics but do not present problems that focus primarily on this content

from question A5

Go to Item B.

A9. Do you make reference to MCAS when you teach the content of this item?

- ❒ 1. No
- ❒ 2. Yes; I tell students that this general content is likely to be included in MCAS.
- ❒ 3. Yes; I tell students that an item like this one is likely to be included in MCAS.
- ❒ 4. Yes; I tell students that this general content is not likely to be included in MCAS.
- ❒ 5. Yes; I tell students that items like this are not likely to be included in MCAS.

A10. Would your emphasis on the content of this item change if your students did not have to take MCAS?

- ❒ 1. It would decrease substantially
- ❒ 2. It would decrease slightly
- ❒ 3. It would not change
- ❒ 4. It would increase slightly
- ❒ 5. It would increase substantially

Go to Item B

Item B. Eva has four sets of straws. The measurements of the straws are given below. Which set of straws could **not** be used to form a triangle?

A. Set 1: 4 cm, 4 cm, 7 cm
B. Set 2: 2 cm, 3 cm, 8 cm
C. Set 3: 3 cm, 4 cm, 5 cm
D. Set 4: 5 cm, 12 cm, 13 cm

B1. Do you recognize this test item?

- ❒ 1. No
- ❒ 2. Yes, from MCAS
- ❒ 3. Yes, from another test

  Which test? _____

- ❒ 4. Yes, from test-preparation materials, a textbook, or other instructional materials

  Which materials? _____

B2. What must a student know or be able to do in order to answer this item correctly? Please briefly note the skill or knowledge you consider most essential. (e.g., "must be able to do simple computations with exponents.")

_____

_____

_____

B3. Do you teach content of this test item in this class?

- ☐ 1. No, I don't teach this content. **Continue to question B4.**
- ☐ 2. I teach this content. **Skip to question B6.**
- ☐ 3. I teach similar content but not exactly this (e.g., "I teach area, but only with regular polygons"). **Skip to question B6.**

If you answered "no" to question B3, continue to question B4. Otherwise, skip to question B6.

B4. Why do you not teach this content?

- ☐ 1. It is not in the curriculum.
- ☐ 2. It is taught in an earlier grade.
- ☐ 3. It is taught in a later grade.
- ☐ 4. It is in the curriculum, but it is not an important topic.
- ☐ 5. It is in the curriculum but it is not emphasized or included in MCAS.
- ☐ 6. Other reason (please specify)

_____

_____

B5. Would you change your emphasis on the content of this item if your students did not have to take MCAS?

- ☐ 1. I still would not teach it.
- ☐ 2. I would give it slight emphasis
- ☐ 3. I would give it substantial emphasis

Go to Item C.

B6. For which of the following reasons do you teach the content of this test item? **(Select as many as apply.)**

- ☐ 1. It is part of the curriculum for this grade and course
- ☐ 2. It is not part of the curriculum for this grade and course, but I include it as review or to help students learn other material included in the curriculum.
- ☐ 3. It helps students do well on MCAS.
- ☐ 4. It helps students do well on other tests.
- ☐ 5. It is preparation for more advanced mathematics courses

B7. How much emphasis do you give to the content of this test item?

- ☐ 1. It is taught in one lesson; not the primary focus of that lesson.
- ☐ 2. It is the primary or sole focus of a single lesson.
- ☐ 3. It is the primary or sole focus of two lessons.
- ☐ 4. It is taught over an extended period of time (e.g., woven through an investigation).

B8. Which of the following best characterizes the way you teach this content?

- ☐ 1. I have presented this test item
- ☐ 2. I present problems with similar content and similar format
- ☐ 3. I present problems with similar content that do not resemble this test item
- ☐ 4. I present this content in the context of other topics but do not present problems that focus primarily on this content

from question B5

Go to Item C

B9. Do you make reference to MCAS when you teach the content of this item?

- ❒ 1. No
- ❒ 2. Yes; I tell students that this general content is likely to be included in MCAS.
- ❒ 3. Yes; I tell students that an item like this one is likely to be included in MCAS.
- ❒ 4. Yes; I tell students that this general content is not likely to be included in MCAS.
- ❒ 5. Yes; I tell students that items like this are not likely to be included in MCAS.

B10. Would your emphasis on the content of this item change if your students did not have to take MCAS?

- ❒ 1. It would decrease substantially
- ❒ 2. It would decrease slightly
- ❒ 3. It would not change
- ❒ 4. It would increase slightly
- ❒ 5. It would increase substantially

Go to Item C.

Item C. A poll is being taken at Baker Junior High School to determine whether to change the school mascot. Which of the following would be the best place to find a sample of students to interview that would be most representative of the entire student body?

A) An algebra class
B) The cafeteria
C) The guidance office
D) A French class
E) The faculty room

C1. Do you recognize this test item?

- ❒ 1. No
- ❒ 2. Yes, from MCAS
- ❒ 3. Yes, from another test

  Which test? _____
- ❒ 4. Yes, from test-preparation materials, a textbook, or other instructional materials

  Which materials? _____

C2. What must a student know or be able to do in order to answer this item correctly? Please briefly note the skill or knowledge you consider most essential. (e.g., "must be able to do simple computations with exponents.")

_____

_____

C3. Do you teach content of this test item in this class?

—— ❒ 1. No, I don't teach this content. **Continue to question C4.**

❒ 2. I teach this content. **Skip to question C6.**

❒ 3. I teach similar content but not exactly this (e.g., "I teach area, but only with regular polygons"). **Skip to question C6.**

If you answered "no" to question C3, continue to question C4. Otherwise, skip to question C6.

C4. Why do you not teach this content?

❒ 1. It is not in the curriculum.

❒ 2. It is taught in an earlier grade.

❒ 3. It is taught in a later grade.

❒ 4. It is in the curriculum, but it is not an important topic.

❒ 5. It is in the curriculum but it is not emphasized or included in MCAS.

❒ 6. Other reason (please specify)

_____

_____

C5. Would you change your emphasis on the content of this item if your students did not have to take MCAS?

❒ 1. I still would not teach it.

❒ 2. I would give it slight emphasis

❒ 3. I would give it substantial emphasis

Go to Item D.

C6. For which of the following reasons do you teach the content of this test item? **(Select as many as apply.)**

❒ 1. It is part of the curriculum for this grade and course

❒ 2. It is not part of the curriculum for this grade and course, but I include it as review or to help students learn other material included in the curriculum.

❒ 3. It helps students do well on MCAS.

❒ 4. It helps students do well on other tests.

❒ 5. It is preparation for more advanced mathematics courses

C7. How much emphasis do you give to the content of this test item?

❒ 1. It is taught in one lesson; not the primary focus of that lesson.

❒ 2. It is the primary or sole focus of a single lesson.

❒ 3. It is the primary or sole focus of two lessons.

❒ 4. It is taught over an extended period of time (e.g., woven through an investigation).

C8. Which of the following best characterizes the way you teach this content?

❒ 1. I have presented this test item

❒ 2. I present problems with similar content and similar format

❒ 3. I present problems with similar content that do not resemble this test item

❒ 4. I present this content in the context of other topics but do not present problems that focus primarily on this content

from question C5

Go to Item D.

C9. Do you make reference to MCAS when you teach the content of this item?

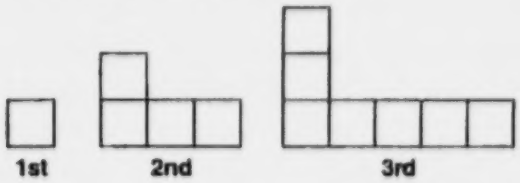
- ❒ 1. No
- ❒ 2. Yes; I tell students that this general content is likely to be included in MCAS.
- ❒ 3. Yes; I tell students that an item like this one is likely to be included in MCAS.
- ❒ 4. Yes; I tell students that this general content is not likely to be included in MCAS.
- ❒ 5. Yes; I tell students that items like this are not likely to be included in MCAS.

C10. Would your emphasis on the content of this item change if your students did not have to take MCAS?

- ❒ 1. It would decrease substantially
- ❒ 2. It would decrease slightly
- ❒ 3. It would not change
- ❒ 4. It would increase slightly
- ❒ 5. It would increase substantially

Go to Item D.

Item D. Each arrangement in this pattern is made up of tiles.



How many tiles will be in the 6th arrangement in the pattern?

D1. Do you recognize this test item?

- ❒ 1. No
- ❒ 2. Yes, from MCAS
- ❒ 3. Yes, from another test

  Which test? _____
- ❒ 4. Yes, from test-preparation materials, a textbook, or other instructional materials

  Which materials? _____

D2. What must a student know or be able to do in order to answer this item correctly? Please briefly note the skill or knowledge you consider most essential. (e.g., "must be able to do simple computations with exponents.")

_____

_____

D3. Do you teach content of this test item in this class?

- ❒ 1. No, I don't teach this content. **Continue to question D4.**
- ❒ 2. I teach this content. **Skip to question D6.**
- ❒ 3. I teach similar content but not exactly this (e.g., "I teach area, but only with regular polygons"). **Skip to question D6.**

If you answered "no" to question D3, continue to question D4. Otherwise, skip to question D6.

D4. Why do you not teach this content?

- ❒ 1. It is not in the curriculum.
- ❒ 2. It is taught in an earlier grade.
- ❒ 3. It is taught in a later grade.
- ❒ 4. It is in the curriculum, but it is not an important topic.
- ❒ 5. It is in the curriculum but it is not emphasized or included in MCAS.
- ❒ 6. Other reason (please specify)

_____

_____

D5. Would you change your emphasis on the content of this item if your students did not have to take MCAS?

- ❒ 1. I still would not teach it.
- ❒ 2. I would give it slight emphasis
- ❒ 3. I would give it substantial emphasis

Go to item E.

D6. For which of the following reasons do you teach the content of this test item? **(Select as many as apply.)**

- ❒ 1. It is part of the curriculum for this grade and course
- ❒ 2. It is not part of the curriculum for this grade and course, but I include it as review or to help students learn other material included in the curriculum.
- ❒ 3. It helps students do well on MCAS.
- ❒ 4. It helps students do well on other tests.
- ❒ 5. It is preparation for more advanced mathematics courses

D7. How much emphasis do you give to the content of this test item?

- ❒ 1. It is taught in one lesson; not the primary focus of that lesson.
- ❒ 2. It is the primary or sole focus of a single lesson.
- ❒ 3. It is the primary or sole focus of two lessons.
- ❒ 4. It is taught over an extended period of time (e.g., woven through an investigation).

D8. Which of the following best characterizes the way you teach this content?

- ❒ 1. I have presented this test item
- ❒ 2. I present problems with similar content and similar format
- ❒ 3. I present problems with similar content that do not resemble this test item
- ❒ 4. I present this content in the context of other topics but do not present problems that focus primarily on this content

from question D5

Go to Item E

D9. Do you make reference to MCAS when you *teach the content of this item?*

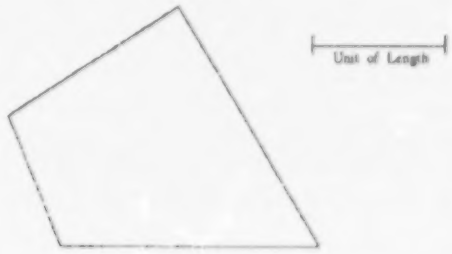
- ❒ 1. No
- ❒ 2. Yes; I tell students that this general content is likely to be included in MCAS.
- ❒ 3. Yes; I tell students that an item like this one is likely to be included in MCAS.
- ❒ 4. Yes; I tell students that this general content is not likely to be included in MCAS.
- ❒ 5. Yes; I tell students that items like this are not likely to be included in MCAS.

D10. Would your emphasis on the content of this item change if your students did not have to take MCAS?

- ❒ 1. It would decrease substantially
- ❒ 2. It would decrease slightly
- ❒ 3. It would not change
- ❒ 4. It would increase slightly
- ❒ 5. It would increase substantially

Go to Item E.

Item E. Use the unit of length below to estimate the perimeter of the figure shown. Between which two consecutive whole-number units does the perimeter lie?



Answer: Between _____ and _____

E1. Do you recognize this test item?

- ❒ 1. No
- ❒ 2. Yes, from MCAS
- ❒ 3. Yes, from another test

  Which test? _____
- ❒ 4. Yes, from test-preparation materials, a textbook, or other instructional materials

  Which materials? _____

E2. What must a student know or be able to do in order to answer this item correctly? Please briefly note the skill or knowledge you consider most essential. (e.g., "must be able to do simple computations with exponents.")

_____

_____

_____

E3. Do you teach content of this test item in this class?

- ☐ 1. No, I don't teach this content. **Continue to question E4.**
- ☐ 2. I teach this content. **Skip to question E6.**
- ☐ 3. I teach similar content but not exactly this (e.g., "I teach area, but only with regular polygons"). **Skip to question E6.**

If you answered "no" to question E3, continue to question E4. Otherwise, skip to question E6.

E4. Why do you not teach this content?

- ☐ 1. It is not in the curriculum.
- ☐ 2. It is taught in an earlier grade.
- ☐ 3. It is taught in a later grade.
- ☐ 4. It is in the curriculum, but it is not an important topic.
- ☐ 5. It is in the curriculum but it is not emphasized or included in MCAS.
- ☐ 6. Other reason (please specify)

_____

_____

E5. Would you change your emphasis on the content of this item if your students did not have to take MCAS?

- ☐ 1. I still would not teach it.
- ☐ 2. I would give it slight emphasis
- ☐ 3. I would give it substantial emphasis

Go to item F.

E6. For which of the following reasons do you teach the content of this test item? **(Select as many as apply.)**

- ☐ 1. It is part of the curriculum for this grade and course
- ☐ 2. It is not part of the curriculum for this grade and course, but I include it as review or to help students learn other material included in the curriculum.
- ☐ 3. It helps students do well on MCAS.
- ☐ 4. It helps students do well on other tests.
- ☐ 5. It is preparation for more advanced mathematics courses

E7. How much emphasis do you give to the content of this test item?

- ☐ 1. It is taught in one lesson; not the primary focus of that lesson.
- ☐ 2. It is the primary or sole focus of a single lesson.
- ☐ 3. It is the primary or sole focus of two lessons.
- ☐ 4. It is taught over an extended period of time (e.g., woven through an investigation).

E8. Which of the following best characterizes the way you teach this content?

- ☐ 1. I have presented this test item
- ☐ 2. I present problems with similar content and similar format
- ☐ 3. I present problems with similar content that do not resemble this test item
- ☐ 4. I present this content in the context of other topics but do not present problems that focus primarily on this content

from question E5

Go to Item F.

E9. Do you make reference to MCAS when you teach the content of this item?

- ❒ 1. No
- ❒ 2. Yes; I tell students that this general content is likely to be included in MCAS.
- ❒ 3. Yes; I tell students that an item like this one is likely to be included in MCAS.
- ❒ 4. Yes; I tell students that this general content is not likely to be included in MCAS.
- ❒ 5. Yes; I tell students that items like this are not likely to be included in MCAS.

E10. Would your emphasis on the content of this item change if your students did not have to take MCAS?

- ❒ 1. It would decrease substantially
- ❒ 2. It would decrease slightly
- ❒ 3. It would not change
- ❒ 4. It would increase slightly
- ❒ 5. It would increase substantially

Go to Item F.

Item F. *Use the balance scales below to answer the question below.*

Figure 1

Figure 2

How many cylinders must be placed on the empty side of the second scale to make that scale balance?

A. 5
B. 2
C. 3
D. 4

F1. Do you recognize this test item?

- ❒ 1. No
- ❒ 2. Yes, from MCAS
- ❒ 3. Yes, from another test

Which test? _____

- ❒ 4. Yes, from test-preparation materials, a textbook, or other instructional materials

Which materials? _____

F2. What must a student know or be able to do in order to answer this item correctly? Please briefly note the skill or knowledge you consider most essential. *(e.g., "must be able to do simple computations with exponents.")*

_____

_____

_____

F3. Do you teach content of this test item in this class?

- ❒ 1. No, I don't teach this content. **Continue to question F4.**
- ❒ 2. I teach this content. **Skip to question F6.**
- ❒ 3. I teach similar content but not exactly this (e.g., "I teach area, but only with regular polygons"). **Skip to question F6.**

If you answered "no" to question F3, continue to question F4. Otherwise, skip to question F6.

F4. Why do you not teach this content?

- ❒ 1. It is not in the curriculum.
- ❒ 2. It is taught in an earlier grade.
- ❒ 3. It is taught in a later grade.
- ❒ 4. It is in the curriculum, but it is not an important topic.
- ❒ 5. It is in the curriculum but it is not emphasized or included in MCAS.
- ❒ 6. Other reason (please specify)

_____

_____

F5. Would you change your emphasis on the content of this item if your students did not have to take MCAS?

- ❒ 1. I still would not teach it.
- ❒ 2. I would give it slight emphasis
- ❒ 3. I would give it substantial emphasis

Go to Item G.

F6. For which of the following reasons do you teach the content of this test item? **(Select as many as apply.)**

- ❒ 1. It is part of the curriculum for this grade and course
- ❒ 2. It is not part of the curriculum for this grade and course, but I include it as review or to help students learn other material included in the curriculum.
- ❒ 3. It helps students do well on MCAS.
- ❒ 4. It helps students do well on other tests.
- ❒ 5. It is preparation for more advanced mathematics courses

F7. How much emphasis do you give to the content of this test item?

- ❒ 1. It is taught in one lesson; not the primary focus of that lesson.
- ❒ 2. It is the primary or sole focus of a single lesson.
- ❒ 3. It is the primary or sole focus of two lessons.
- ❒ 4. It is taught over an extended period of time (e.g., woven through an investigation).

F8. Which of the following best characterizes the way you teach this content?

- ❒ 1. I have presented this test item
- ❒ 2. I present problems with similar content and similar format
- ❒ 3. I present problems with similar content that do not resemble this test item
- ❒ 4. I present this content in the context of other topics but do not present problems that focus primarily on this content

from question F5

F9. Do you make reference to MCAS when you teach the content of this item?

- ❒ 1. No
- ❒ 2. Yes; I tell students that this general content is likely to be included in MCAS
- ❒ 3. Yes; I tell students that an item like this one is likely to be included in MCAS.
- ❒ 4. Yes; I tell students that this general content is not likely to be included in MCAS.
- ❒ 5. Yes; I tell students that items like this are not likely to be included in MCAS.

F10. Would your emphasis on the content of this item change if your students did not have to take MCAS?

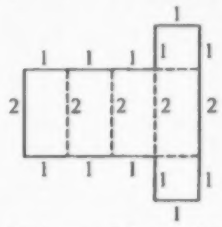
- ❒ 1. It would decrease substantially
- ❒ 2. It would decrease slightly
- ❒ 3. It would not change
- ❒ 4. It would increase slightly
- ❒ 5. It would increase substantially

Go to Item G.

Go to Item G

Item G. The pattern shown below is for a square prism. The lengths of the line segments in the pattern were chosen so that the pattern could be folded along the dotted lines into the prism shown.

a. Make a sketch of a pattern for a triangular prism. Label **each** line segment with a



length that will make it possible to fold the pattern into the triangular prism.

b. Make a sketch of a pattern for a cylinder. Label **each** line segment and diameter in your pattern with a length that will make it possible to create the cylinder from the pattern.

G1. Do you recognize this test item?

- ❒ 1. No
- ❒ 2. Yes, from MCAS
- ❒ 3. Yes, from another test

  Which test? _____

- ❒ 4. Yes, from test-preparation materials, a textbook, or other instructional materials

  Which materials? _____

G2. What must a student know or be able to do in order to answer this item correctly? Please briefly note the skill or knowledge you consider most essential. (e.g., "must be able to do simple computations with exponents.")

_____

_____

_____

G3. Do you teach content of this test item in this class?

- ❒ 1. No, I don't teach this content. **Continue to question G4.**
- ❒ 2. I teach this content. **Skip to question G6.**
- ❒ 3. I teach similar content but not exactly this (e.g., "I teach area, but only with regular polygons"). **Skip to question G6.**

If you answered "no" to question G3, continue to question G4. Otherwise, skip to question G6.

G4. Why do you not teach this content?

- ❒ 1. It is not in the curriculum.
- ❒ 2. It is taught in an earlier grade.
- ❒ 3. It is taught in a later grade.
- ❒ 4. It is in the curriculum, but it is not an important topic.
- ❒ 5. It is in the curriculum but it is not emphasized or included in MCAS.
- ❒ 6. Other reason (please specify)

_____

_____

G5. Would you change your emphasis on the content of this item if your students did not have to take MCAS?

- ❒ 1. I still would not teach it.
- ❒ 2. I would give it slight emphasis
- ❒ 3. I would give it substantial emphasis

Go to Item H.

G6. For which of the following reasons do you teach the content of this test item? **(Select as many as apply.)**

- ❒ 1. It is part of the curriculum for this grade and course
- ❒ 2. It is not part of the curriculum for this grade and course, but I include it as review or to help students learn other material included in the curriculum.
- ❒ 3. It helps students do well on MCAS.
- ❒ 4. It helps students do well on other tests.
- ❒ 5. It is preparation for more advanced mathematics courses

G7. How much emphasis do you give to the content of this test item?

- ❒ 1. It is taught in one lesson; not the primary focus of that lesson.
- ❒ 2. It is the primary or sole focus of a single lesson.
- ❒ 3. It is the primary or sole focus of two lessons.
- ❒ 4. It is taught over an extended period of time (e.g., woven through an investigation).

from question G5

Go to Item H.

G8. Which of the following best characterizes the way you teach this content?

- ☐ 1. I have presented this test item
- ☐ 2. I present problems with similar content and similar format
- ☐ 3. I present problems with similar content that do not resemble this test item
- ☐ 4. I present this content in the context of other topics but do not present problems

G9. Do you make reference to MCAS when you teach the content of this item?

- ☐ 1. No
- ☐ 2. Yes; I tell students that this general content is likely to be included in MCAS.
- ☐ 3. Yes; I tell students that an item like this one is likely to be included in MCAS.
- ☐ 4. Yes; I tell students that this general content is not likely to be included in MCAS.
- ☐ 5. Yes; I tell students that items like this are not likely to be included in MCAS.

G10. Would your emphasis on the content of this item change if your students did not have to take MCAS?

- ☐ 1. It would decrease substantially
- ☐ 2. It would decrease slightly
- ☐ 3. It would not change
- ☐ 4. It would increase slightly
- ☐ 5. It would increase substantially

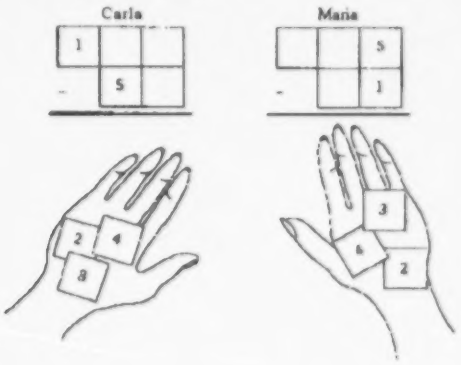
Go to Item H.

TO NEXT PAGE

Item H. This question requires you to show your work and explain your reasoning. You may use drawings, words, and numbers in your explanation. Your answer should be clear enough so that another person could read it and understand your thinking. It is important that you show all you work.

In a game, Carla and Maria are making subtraction problems using tiles numbered 1 to 5. The player whose subtraction problem gives the largest answer wins the game.

Look at where each girl placed two of her tiles.



Who will win the game? _____

Explain how you know this person will win.

_____

H1. Do you recognize this test item?

- ☐ 1. No
- ☐ 2. Yes, from MCAS
- ☐ 3. Yes, from another test

  Which test? _____
- ☐ 4. Yes, from test-preparation materials, a textbook, or other instructional materials

  Which materials? _____

H2. What must a student know or be able to do in order to answer this item correctly? Please briefly note the skill or knowledge you consider most essential. (e.g., "must be able to do simple computations with exponents.")

_____

_____

_____

H3. Do you teach content of this test item in this class?

- ❒ 1. No, I don't teach this content. **Continue to question H4.**
- ❒ 2. I teach this content. **Skip to question H6.**
- ❒ 3. I teach similar content but not exactly this (e.g., "I teach area, but only with regular polygons"). **Skip to question H6.**

If you answered "no" to question H3, continue to question H4. Otherwise, skip to question H6.

H4. Why do you not teach this content?

- ❒ 1. It is not in the curriculum.
- ❒ 2. It is taught in an earlier grade.
- ❒ 3. It is taught in a later grade.
- ❒ 4. It is in the curriculum, but it is not an important topic.
- ❒ 5. It is in the curriculum but it is not emphasized or included in MCAS.
- ❒ 6. Other reason (please specify)

_____

_____

H5. Would you change your emphasis on the content of this item if your students did not have to take MCAS?

- ❒ 1. I still would not teach it.
- ❒ 2. I would give it slight emphasis
- ❒ 3. I would give it substantial emphasis

Go to Item I.

H6. For which of the following reasons do you teach the content of this test item? **(Select as many as apply.)**

- ❒ 1. It is part of the curriculum for this grade and course
- ❒ 2. It is not part of the curriculum for this grade and course, but I include it as review or to help students learn other material included in the curriculum.
- ❒ 3. It helps students do well on MCAS.
- ❒ 4. It helps students do well on other tests.
- ❒ 5. It is preparation for more advanced mathematics courses

H7. How much emphasis do you give to the content of this test item?

- ❒ 1. It is taught in one lesson; not the primary focus of that lesson.
- ❒ 2. It is the primary or sole focus of a single lesson.
- ❒ 3. It is the primary or sole focus of two lessons.
- ❒ 4. It is taught over an extended period of time (e.g., woven through an investigation).

H8. Which of the following best characterizes the way you teach this content?

- ❒ 1. I have presented this test item
- ❒ 2. I present problems with similar content and similar format
- ❒ 3. I present problems with similar content that do not resemble this test item
- ❒ 4. I present this content in the context of other topics but do not present problems that focus primarily on this content

from question H5

Go to Item I.

H9. Do you make reference to MCAS when you teach the content of this item?

- ☐ 1. No
- ☐ 2. Yes; I tell students that this general content is likely to be included in MCAS.
- ☐ 3. Yes; I tell students that an item like this one is likely to be included in MCAS.
- ☐ 4. Yes; I tell students that this general content is not likely to be included in MCAS.
- ☐ 5. Yes; I tell students that items like this are not likely to be included in MCAS.

H10. Would your emphasis on the content of this item change if your students did not have to take MCAS?

- ☐ 1. It would decrease substantially
- ☐ 2. It would decrease slightly
- ☐ 3. It would not change
- ☐ 4. It would increase slightly
- ☐ 5. It would increase substantially

Go to Item I.

Item I. If each of the counting numbers from 1 through 10 is multiplied by 13, how many of the resulting numbers will be even?

A) One
B) Four
C) Five
D) Six
E) Ten

I1. Do you recognize this test item?

- ☐ 1. No
- ☐ 2. Yes, from MCAS
- ☐ 3. Yes, from another test

  Which test? _____

- ☐ 4. Yes, from test-preparation materials, a textbook, or other instructional materials

  Which materials? _____

I2. What must a student know or be able to do in order to answer this item correctly? Please briefly note the skill or knowledge you consider most essential. (e.g., "must be able to do simple computations with exponents.")

_____

_____

_____

I3. Do you teach content of this test item in this class?

- ❒ 1. No, I don't teach this content. **Continue to question I4.**
- ❒ 2. I teach this content. **Skip to question I6.**
- ❒ 3. I teach similar content but not exactly this (e.g., "I teach area, but only with regular polygons"). **Skip to question I6.**

If you answered "no" to question I3, continue to question I4. Otherwise, skip to question I6.

I4. Why do you not teach this content?

- ❒ 1. It is not in the curriculum.
- ❒ 2. It is taught in an earlier grade.
- ❒ 3. It is taught in a later grade.
- ❒ 4. It is in the curriculum, but it is not an important topic.
- ❒ 5. It is in the curriculum but it is not emphasized or included in MCAS.
- ❒ 6. Other reason (please specify)

_____

_____

I5. Would you change your emphasis on the content of this item if your students did not have to take MCAS?

- ❒ 1. I still would not teach it.
- ❒ 2. I would give it slight emphasis
- ❒ 3. I would give it substantial emphasis

Go to Item J.

I6. For which of the following reasons do you teach the content of this test item? **(Select as many as apply.)**

- ❒ 1. It is part of the curriculum for this grade and course
- ❒ 2. It is not part of the curriculum for this grade and course, but I include it as review or to help students learn other material included in the curriculum.
- ❒ 3. It helps students do well on MCAS.
- ❒ 4. It helps students do well on other tests.
- ❒ 5. It is preparation for more advanced mathematics courses

I7. How much emphasis do you give to the content of this test item?

- ❒ 1. It is taught in one lesson; not the primary focus of that lesson.
- ❒ 2. It is the primary or sole focus of a single lesson.
- ❒ 3. It is taught in two lessons.
- ❒ 4. It is taught in three or more lessons.

I8. Which of the following best characterizes the way you teach this content?

- ❒ 1. I have presented this test item
- ❒ 2. I present problems with similar content and similar format
- ❒ 3. I present problems with similar content that do not resemble this test item
- ❒ 4. I present this content in the context of other topics but do not present problems that focus primarily on this content

from question I5

Go to Item J.

I9. Do you make reference to MCAS when you teach the content of this item?

- ☐ 1. No
- ☐ 2. Yes; I tell students that this general content is likely to be included in MCAS.
- ☐ 3. Yes; I tell students that an item like this one is likely to be included in MCAS.
- ☐ 4. Yes; I tell students that this general content is not likely to be included in MCAS.
- ☐ 5. Yes; I tell students that items like this are not likely to be included in MCAS.

I10. Would your emphasis on the content of this item change if your students did not have to take MCAS?

- ☐ 1. It would decrease substantially
- ☐ 2. It would decrease slightly
- ☐ 3. It would not change
- ☐ 4. It would increase slightly
- ☐ 5. It would increase substantially

Go to Item J.

Item J. Erin is writing a science fiction story. She has invented a money system for her planet that uses four coins that she drew and name like this:

She has challenged her classmates to determine the relationships among the values of the

CLUE 1:
3 Cs are worth the same as 1 T and 1 C.

CLUE 2:
Kay bought a game costing H R R.
She gave the clerk 2 Hs. Her change was 1 R.

CLUE 3:
Kay and Max have the same amount of money.
Kay has 1 R, 4 Cs, and 1 H.
Max has 3 Rs and 6 Ts.

coins from the following clues.

a. Use Clue 1 above to find how many Cs equal 1 . Use words or pictures to explain your reasoning.

b. Use Clue 2 to find how many Rs equal 1 . Use words or pictures to explain your reasoning.

c. Use Clue 3 and your answers to parts a and b to find how many s equal 1 R. Use words or pictures to explain your reasoning.

d. Erin told her classmates that 1 C is worth 25¢ in U.S. money. What is the value in U.S. money of **each** of the following?

- 1
- 1 R
- 1

e. Use Clue 1 above to find how many Cs equal 1 . Use words or pictures to explain your reasoning.

f. Use Clue 2 to find how many Rs equal 1 . Use words or pictures to explain your reasoning.

g. Use Clue 3 and your answers to parts a and b to find how many s equal 1 R. Use words or pictures to explain your reasoning.

h. Erin told her classmates that 1 C is worth 25¢ in U.S. money. What is the value in U.S. money of **each** of the following?

- 1
- 1 R
- 1

TO NEXT PAGE

J1. Do you recognize this test item?

- ☐ 1. No
- ☐ 2. Yes, from MCAS
- ☐ 3. Yes, from another test

  Which test? _____
- ☐ 4. Yes, from test-preparation materials, a textbook, or other instructional materials

  Which materials? _____

J2. What must a student know or be able to do in order to answer this item correctly? Please briefly note the skill or knowledge you consider most essential. (e.g., "must be able to do simple computations with exponents.")

_____

_____

_____

J3. Do you teach content of this test item in this class?

- ☐ 1. No, I don't teach this content. **Continue to question J4.**
- ☐ 2. I teach this content. **Skip to question J6.**
- ☐ 3. I teach similar content but not exactly this (e.g., "I teach area, but only with regular polygons"). **Skip to question J6.**

If you answered "no" to question J3, continue to question J4. Otherwise, skip to question J6.

J4. Why do you not teach this content?

- ☐ 1. It is not in the curriculum.
- ☐ 2. It is taught in an earlier grade.
- ☐ 3. It is taught in a later grade.
- ☐ 4. It is in the curriculum, but it is not an important topic.
- ☐ 5. It is in the curriculum but it is not emphasized or included in MCAS.
- ☐ 6. Other reason (please specify)

_____

_____

J5. Would you change your emphasis on the content of this item if your students did not have to take MCAS?

- ☐ 1. I still would not teach it.
- ☐ 2. I would give it slight emphasis
- ☐ 3. I would give it substantial emphasis

Go to next page.

J6. For which of the following reasons do you teach the content of this test item? **(Select as many as apply.)**

- ☐ 1. It is part of the curriculum for this grade and course
- ☐ 2. It is not part of the curriculum for this grade and course, but I include it as review or to help students learn other material included in the curriculum.
- ☐ 3. It helps students do well on MCAS.
- ☐ 4. It helps students do well on other tests.
- ☐ 5. It is preparation for more advanced mathematics courses

from question J5

Go to next page.

J7. How much emphasis do you give to the content of this test item?

- ❒ 1. It is taught in one lesson; not the primary focus of that lesson.
- ❒ 2. It is the primary or sole focus of a single lesson.
- ❒ 3. It is the primary or sole focus of two lessons.
- ❒ 4. It is taught over an extended period of time (e.g., woven through an investigation).

J8. Which of the following best characterizes the way you teach this content?

- ❒ 1. I have presented this test item
- ❒ 2. I present problems with similar content and similar format
- ❒ 3. I present problems with similar content that do not resemble this test item
- ❒ 4. I present this content in the context of other topics but do not present problems that focus primarily on this content

J9. Do you make reference to MCAS when you teach the content of this item?

- ❒ 1. No
- ❒ 2. Yes; I tell students that this general content is likely to be included in MCAS.
- ❒ 3. Yes; I tell students that an item like this one is likely to be included in MCAS.
- ❒ 4. Yes; I tell students that this general content is not likely to be included in MCAS.
- ❒ 5. Yes; I tell students that items like this are not likely to be included in MCAS.

J10. Would your emphasis on the content of this item change if your students did not have to take MCAS?

- ❒ 1. It would decrease substantially
- ❒ 2. It would decrease slightly
- ❒ 3. It would not change
- ❒ 4. It would increase slightly
- ❒ 5. It would increase substantially

Go to next page.

Questions about content Areas

In this section, we will ask you a series of questions about several mathematics content areas. Each area is described in terms of a student proficiency.

NOTE: When we use the term "content," it refers to the knowledge AND the skills needed to answer a given test item.

A. Use proportional thinking to solve problems (including rates, scaling, and similarity)

A1. Do you teach this content in the target class?

- ❒ 1. No, I don't teach this content. **Go to question A2.**
- ❒ 2. I teach this content. **Skip to question A4.**
- ❒ 3. I teach similar content but not exactly this. **Skip to question A4**

If you answered "no" to question A1, continue to question A2. Otherwise, skip to question A4.

A2. Why do you not teach this content in the target class?

- ❒ 1. It is not in the curriculum.
- ❒ 2. It is taught in an earlier grade.
- ❒ 3. It is taught in a later grade.
- ❒ 4. It is in the curriculum, but it is not an important topic.
- ❒ 5. It is in the curriculum but it is not emphasized or included in MCAS.
- ❒ 6. Other reason (please specify)

_____

_____

A3. How much emphasis would you give this content if your students did not take the MCAS assessment?

- ❒ 1. I still would not teach it
- ❒ 2. I would teach it but would not give it much emphasis.
- ❒ 3. I would give it substantial emphasis.

Go to next content-area listing.

A4. For which of the following reasons do you teach this content ? **(Select as many as apply.)**

- ❒ 1. It is part of the curriculum for this grade and course
- ❒ 2. It is not part of the curriculum for this grade and course, but I include it as review or to help students learn other material included in the curriculum.
- ❒ 3. It helps students do well on MCAS.
- ❒ 4. It helps students do well on other tests.
- ❒ 5. It is preparation for more advanced mathematics courses

A5. Would your emphasis on this content change if your students did not have to take MCAS?

- ❒ 1. It would decrease substantially
- ❒ 2. It would decrease slightly
- ❒ 3. It would not change
- ❒ 4. It would increase slightly
- ❒ 5. It would increase substantially

Go to next content-area listing.

B. Solve problems involving percentages

B1. Do you teach this content in the target class?

- ❒ 1. No, I don't teach this content. **Go to question B2.**
- ❒ 2. I teach this content. **Skip to question B4.**
- ❒ 3. I teach similar content but not exactly this. **Skip to question B4**

If you answered "no" to question B1, continue to question B2. Otherwise, skip to question B4.

B2. Why do you not teach this content in the target class?

- ❒ 1. It is not in the curriculum.
- ❒ 2. It is taught in an earlier grade.
- ❒ 3. It is taught in a later grade.
- ❒ 4. It is in the curriculum, but it is not an important topic.
- ❒ 5. It is in the curriculum but it is not emphasized or included in MCAS.
- 6. Other reason (please specify)

_____

_____

B3. How much emphasis would you give this content if your students did not take the MCAS assessment?

- ❒ 1. I still would not teach it
- ❒ 2. I would teach it but would not give it much emphasis.
- ❒ 3. I would give it substantial emphasis.

Go to next content-area listing.

B4. For which of the following reasons do you teach this content ? **(Select as many as apply.)**

- ❒ 1. It is part of the curriculum for this grade and course
- ❒ 2. It is not part of the curriculum for this grade and course, but I include it as review or to help students learn other material included in the curriculum.
- ❒ 3. It helps students do well on MCAS.
- ❒ 4. It helps students do well on other tests.
- ❒ 5. It is preparation for more advanced mathematics courses

B5. Would your emphasis on this content change if your students did not have to take MCAS?

- ❒ 1. It would decrease substantially
- ❒ 2. It would decrease slightly
- ❒ 3. It would not change
- ❒ 4. It would increase slightly
- ❒ 5. It would increase substantially

Go to the next content area.

C. Solve problems involving perimeter and area (such as triangles, quadrilaterals, other polygons, circles, combined forms)

C1. Do you teach this content in the target class?

—— ❒ 1. No, I don't teach this content. **Go to question C2.**

❒ 2. I teach this content. **Skip to question C4.**

❒ 3. I teach similar content but not exactly this. **Skip to question C4**

If you answered "no" to question C1, continue to question C2. Otherwise, skip to question C4.

C2. Why do you not teach this content in the target class?

❒ 1. It is not in the curriculum.

❒ 2. It is taught in an earlier grade.

❒ 3. It is taught in a later grade.

❒ 4. It is in the curriculum, but it is not an important topic.

❒ 5. It is in the curriculum but it is not emphasized or included in MCAS.

❒ 6. Other reason (please specify)

_____

_____

_____

C3. How much emphasis would you give this content if your students did not take the MCAS assessment?

❒ 1. I still would not teach it

❒ 2. I would teach it but would not give it much emphasis.

❒ 3. I would give it substantial emphasis.

Go to next content-area listing.

C4. For which of the following reasons do you teach this content ? **(Select as many as apply.)**

❒ 1. It is part of the curriculum for this grade and course

❒ 2. It is not part of the curriculum for this grade and course, but I include it as review or to help students learn other material included in the curriculum.

❒ 3. It helps students do well on MCAS.

❒ 4. It helps students do well on other tests.

❒ 5. It is preparation for more advanced mathematics courses

C5. Would your emphasis on this content change if your students did not have to take MCAS?

❒ 1. It would decrease substantially

❒ 2. It would decrease slightly

❒ 3. It would not change

❒ 4. It would increase slightly

❒ 5. It would increase substantially

Go to the next content area.

D. Use transformations (translations, rotations, reflections, dilations, symmetry)

D1. Do you teach this content in the target class?

- ❒ 1. No, I don't teach this content. **Go to question D2.**
- ❒ 2. I teach this content. **Skip to question D4.**
- ❒ 3. I teach similar content but not exactly this. **Skip to question D4.**

If you answered "no" to question D1, continue to question D2. Otherwise, skip to question D4.

D2. Why do you not teach this content in the target class?

- ❒ 1. It is not in the curriculum.
- ❒ 2. It is taught in an earlier grade.
- ❒ 3. It is taught in a later grade.
- ❒ 4. It is in the curriculum, but it is not an important topic.
- ❒ 5. It is in the curriculum but it is not emphasized or included in MCAS.
- 6. Other reason (please specify)

_____

_____

D3. How much emphasis would you give this content if your students did not take the MCAS assessment?

- ❒ 1. I still would not teach it
- ❒ 2. I would teach it but would not give it much emphasis.
- ❒ 3. I would give it substantial emphasis.

Go to next content-area listing.

D4. For which of the following reasons do you teach this content ? **(Select as many as apply.)**

- ❒ 1. It is part of the curriculum for this grade and course
- ❒ 2. It is not part of the curriculum for this grade and course, but I include it as review or to help students learn other material included in the curriculum.
- ❒ 3. It helps students do well on MCAS.
- ❒ 4. It helps students do well on other tests.
- ❒ 5. It is preparation for more advanced mathematics courses

D5. Would your emphasis on this content change if your students did not have to take MCAS?

- ❒ 1. It would decrease substantially
- ❒ 2. It would decrease slightly
- ❒ 3. It would not change
- ❒ 4. It would increase slightly
- ❒ 5. It would increase substantially

Go to the next content area.

E. Use the properties of geometric figures to determine the measurement of angles

E1. Do you teach this content in the target class?

- ☐ 1. No, I don't teach this content. **Go to question E2.**
- ☐ 2. I teach this content. **Skip to question E4**
- ☐ 3. I teach similar content but not exactly this. **Skip to question E4**

If you answered "no" to question E1, continue to question E2. Otherwise, skip to question E4.

E2. Why do you not teach this content in the target class?

- ☐ 1. It is not in the curriculum.
- ☐ 2. It is taught in an earlier grade.
- ☐ 3. It is taught in a later grade.
- ☐ 4. It is in the curriculum, but it is not an important topic.
- ☐ 5. It is in the curriculum but it is not emphasized or included in MCAS.
- 6. Other reason (please specify)

_____

_____

E3. How much emphasis would you give this content if your students did not take the MCAS assessment?

- ☐ 1. I still would not teach it
- ☐ 2. I would teach it but would not give it much emphasis.
- ☐ 3. I would give it substantial emphasis.

Go to next content-area listing.

E4. For which of the following reasons do you teach this content ? **(Select as many as apply.)**

- ☐ 1. It is review of material taught in an earlier
1. It is part of the curriculum for this grade and course
- ☐ 2. It is not part of the curriculum for this grade and course, but I include it as review or to help students learn other material included in the curriculum.
- ☐ 3. It helps students do well on MCAS.
- ☐ 4. It helps students do well on other tests.
- ☐ 5. It is preparation for more advanced mathematics courses

E5. Would your emphasis on this content change if your students did not have to take MCAS?

- ☐ 1. It would decrease substantially
- ☐ 2. It would decrease slightly
- ☐ 3. It would not change
- ☐ 4. It would increase slightly
- ☐ 5. It would increase substantially

Go to the next content area.

F. Extend a pattern or functional relationship

F1. Do you teach this content in the target class?

- ❒ 1. No, I don't teach this content. **Go to question F2.**
- ❒ 2. I teach this content. **Skip to question F4**
- ❒ 3. I teach similar content but not exactly this. **Skip to question F4**

If you answered "no" to question F1, continue to question F2. Otherwise, skip to question F4.

F2. Why do you not teach this content in the target class?

- ❒ 1. It is not in the curriculum.
- ❒ 2. It is taught in an earlier grade.
- ❒ 3. It is taught in a later grade.
- ❒ 4. It is in the curriculum, but it is not an important topic.
- ❒ 5. It is in the curriculum but it is not emphasized or included in MCAS.
- 6. Other reason (please specify)

_____

_____

F3. How much emphasis would you give this content if your students did not take the MCAS assessment?

- ❒ 1. I still would not teach it
- ❒ 2. I would teach it but would not give it much emphasis.
- ❒ 3. I would give it substantial emphasis.

Go to next content-area listing.

F4. For which of the following reasons do you teach this content ? **(Select as many as apply.)**

- ❒ 1. It is part of the curriculum for this grade and course
- ❒ 2. It is not part of the curriculum for this grade and course, but I include it as review or to help students learn other material included in the curriculum.
- ❒ 3. It helps students do well on MCAS.
- ❒ 4. It helps students do well on other tests.
- ❒ 5. It is preparation for more advanced mathematics courses

F5. Would your emphasis on this content change if your students did not have to take MCAS?

- ❒ 1. It would decrease substantially
- ❒ 2. It would decrease slightly
- ❒ 3. It would not change
- ❒ 4. It would increase slightly
- ❒ 5. It would increase substantially

Go to the next content area.

G. Solve systems of equations and inequalities using appropriate methods

G1. Do you teach this content in the target class?

- ☐ 1. No, I don't teach this content. **Go to question G2.**
- ☐ 2. I teach this content. **Skip to question G4.**
- ☐ 3. I teach similar content but not exactly this. **Skip to question G4**

If you answered "no" to question G1, continue to question G2. Otherwise, skip to question G4.

G2. Why do you not teach this content in the target class?

- ☐ 1. It is not in the curriculum.
- ☐ 2. It is taught in an earlier grade.
- ☐ 3. It is taught in a later grade.
- ☐ 4. It is in the curriculum, but it is not an important topic.
- ☐ 5. It is in the curriculum but it is not emphasized or included in MCAS.
- 6. Other reason (please specify)

_____

_____

G3. How much emphasis would you give this content if your students did not take the MCAS assessment?

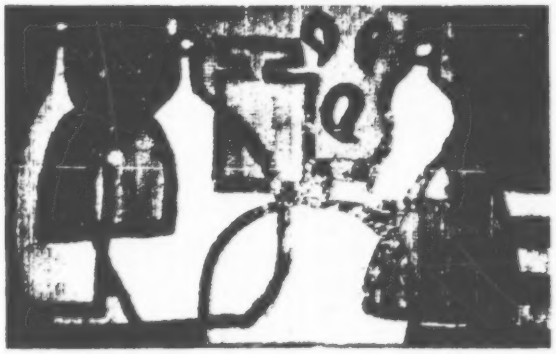
- ☐ 1. I still would not teach it
- ☐ 2. I would teach it but would not give it much emphasis.
- ☐ 3. I would give it substantial emphasis.

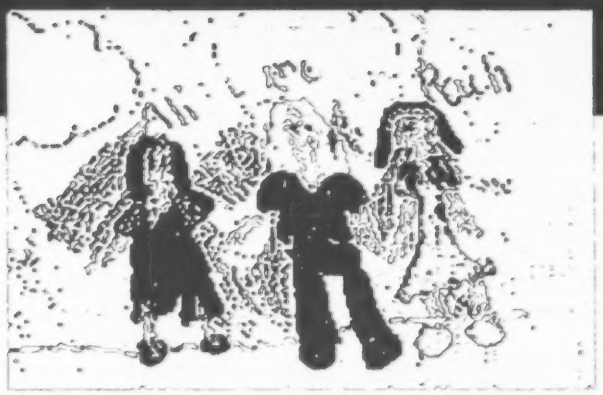
G4. For which of the following reasons do you teach this content ? **(Select as many as apply.)**

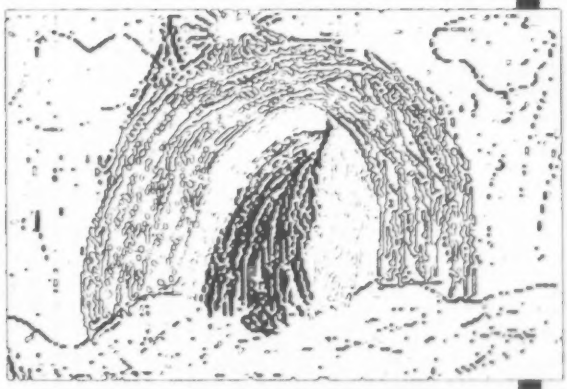
- ☐ 1. It is part of the curriculum for this grade and course
- ☐ 2. It is not part of the curriculum for this grade and course, but I include it as review or to help students learn other material included in the curriculum.
- ☐ 3. It helps students do well on MCAS.
- ☐ 4. It helps students do well on other tests.
- ☐ 5. It is preparation for more advanced mathematics courses

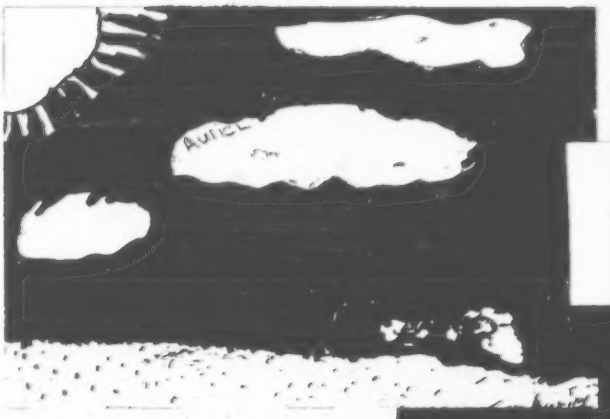
G5. Would your emphasis on this content change if your students did not have to take MCAS?

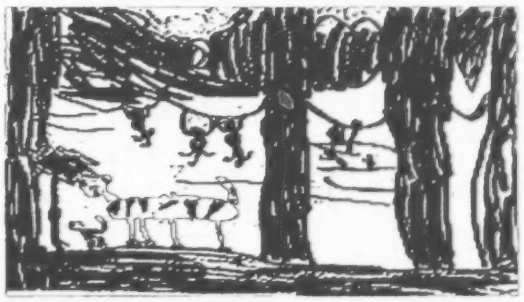
- ☐ 1. It would decrease substantially
- ☐ 2. It would decrease slightly
- ☐ 3. It would not change
- ☐ 4. It would increase slightly
- ☐ 5. It would increase substantially

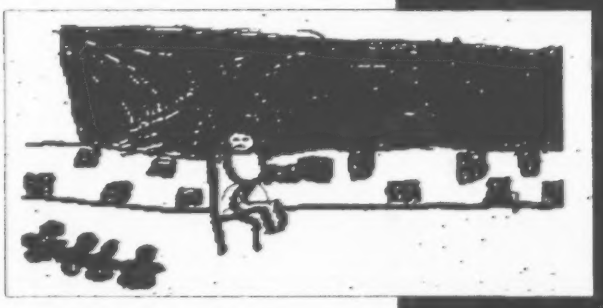












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